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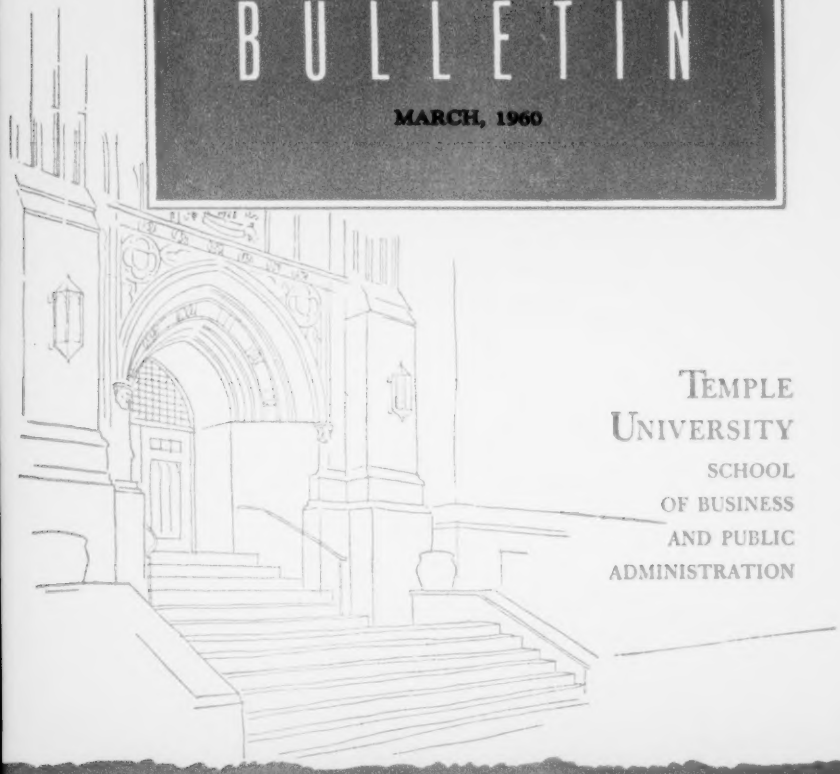

TEMPLE UNIVERSITY
SCHOOL OF BUSINESS AND PUBLIC ADMINISTRATION

A Comparative Analysis of Costs of Insuring Against Losses Due to Automobile Accidents Various Hypotheses — New Jersey, 1955

MARCH, 1960

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PREFACE

INTEREST in the problem of providing for losses sustained in automobile accidents prompted the organization of this study. Its purposes were:

1. *To obtain facts concerning losses due to bodily injury and property damage sustained in automobile accidents and the amounts and types of financial provisions made to deal with them; and*
2. *Given this information, to prepare assumptions concerning alternative methods of providing for these losses and to develop pure insurance costs for each for comparison.*

The study is focused primarily on the accident experience of the State of New Jersey during the calendar year of 1955 and assumes as the "present" situation the socio-legal framework in existence in that State in that year. The sample of New Jersey accidents and accident victims studied was drawn from the records of the Traffic Safety Bureau, and all relationships and estimates of the total situation and pattern are based upon the total record as reported by that agency. Some additional data were obtained from a sample of insurance carriers for a given period within that same year.

To build assumptions for alternative systems of dealing with losses, the present system, compulsory liability, and compensation being the principal variables examined, the experiences of other universes and sub-universes had also to be studied. Massachusetts provided a model for compulsory liability, and the vehicular accident segment of the New Jersey Workmen's Compensation program was used as a model for compensation. In addition, the financial experience of Saskatchewan, Canada, with its automobile accident compensation program was analyzed.

The results of the study, stated as pure premiums, are estimates of cost based upon reports of New Jersey victims and certain other experience patterns. In using these data it must be noted that error limits based on sampling variability are larger than desirable in some cases as, for example, the costs of accidents to pedestrians, where the respondent group was small. However, the data from the company sample, the Saskatchewan experience and other studies, such as the 1953 Philadelphia Study completed by this Bureau, all tended to verify these findings. Thus, while the samples are small in some cases, it is believed that the results are sufficiently indicative to be used and that the errors, though potentially large, are not, in fact, as great as the tests suggest. This limitation, however, makes it necessary to use the resultant cost data with some care and restricts the type and scope of generalizations which one may draw from the analysis presented.

In addition, the data are restricted by virtue of the limited amount of time and data available for evaluative study. No attempt has been made to present or examine the philosophies underlying these separate systems or techniques. Neither has an attempt been made to examine or analyze

the effects of making the assumed changes on the insurance industry, the courts, the legal profession, government, the medical profession, hospitals, etc. The study is confined to determining the financial costs of providing for losses resulting from accidents, through any of several techniques. The mere fact that one appears to be about as cheap as another, while providing total vs. something less than total coverage, is only one element in the evaluation and other factors may well offset or negate this one advantage. Further study will be needed to obtain the basic facts necessary to make a decision to accept one of the alternatives to, or, for that matter, to change from the present system. One is moved to observe on this point that, almost without regard to the facts, the decision on this issue will be as much a matter of social philosophy as of fact and that, given the same facts, it may well differ between any two scholars, business people, or citizens.

The financial resources available to the study were fixed in advance. Difficulties in data collection required use of these resources to improve data rather than to examine related issues. Had larger resources been available, both better (larger samples) data and a more complete examination of the issues involved in the problem could have been prepared. What has been done has sufficient merit to warrant considerable study by representatives of the industry, government, academicians, and the public. It is presented for this purpose, subject to the limitations cited, without apology.

Acknowledgments

This study was financed by grants from the Dorothy H. and Lewis Rosenstiel Foundation of New York, New York, and the Robert S. Marx Foundation of Cincinnati, Ohio. The sincere interest of both Foundations and, in particular, that of Judge Robert S. Marx must be acknowledged. However, despite keen interest in one facet of the problem to be studied, no one associated with either Foundation has sought to influence the results of this work. In fact, the findings and conclusions represent the judgements of the research team which has conducted the study and do not necessarily reflect the views of anyone associated with either Foundation.

The background for this work was developed earlier by the Bureau staff through the preparation of ***A Survey of the Economic-Financial Consequences of Personal Injuries Resulting from Automobile Accidents in the City of Philadelphia, 1953.*** *This work was prepared under grant from the Nationwide Mutual Insurance Companies.*

When the idea for the present study was developed it became necessary to seek cooperation of the public officials of a state to obtain access to the basic records necessary for building a sample. New Jersey Governor Robert B. Meyner was generally interested in the topic under study and, when the program was presented to him, agreed that the study might be prepared for the State of New Jersey on the condition that the findings be made available for use. The Director of the Division of Motor Vehicles, Frederick J. Gassert, Jr., also was most interested in the study and arranged for the cooperation

of his department in its development. John E. Smiley, Chief, Research Records Section, met with the study group and participated in the development of the sampling procedure. Subsequently, he and the members of his staff drew the sample and prepared the original records and tabulations for the study.

Joseph A. Humphreys, Commissioner of Insurance for Massachusetts, expressed interest in the study and arranged for the cooperation of the Massachusetts Insurance Department in this study. M. G. McDonald, Chief Casualty Actuary for the Commonwealth, met with a representative of the study staff and supplied all necessary information.

H. L. Hammond, General Manager of the Saskatchewan Government Insurance Office, agreed to provide access to facilities and data concerning the Province's program for study. The gracious and sincere efforts of his office staff, including John Green, Legal Advisor; J. A. Waters, Chief Automobile Accident Underwriter; Leonard James, Director, Public Relations; R. D. Blackburn, Secretary; L. M. Mackay, Asst. Secretary in charge of Automobile Accidents; and particularly, Jeffery G. Bartlett, then Chief Statistician, were essential to the development of this study.

Thanks are also due ten major public liability insurance carriers of New Jersey which, when asked to cooperate by supplying detailed case records for analysis, did so, where possible, without delay and objection. The staff of the New Jersey Division of Workmen's Compensation, under the direction of Ned J. Parsekian, also cooperated with the Bureau staff in developing data for analysis.

Finally the untiring efforts of Dr. William H. Wandel, Director of Research and Robert W. Griffith, Casualty Actuary, both of the Nationwide Mutual Insurance Companies are acknowledged. Both men reviewed the study plan, making many valuable suggestions, and later the study itself in preliminary and final forms. Their suggestions as to methodology and interpretation have been invaluable to the research group.

The study was conducted by the Bureau of Economic and Business Research of this University. Much of the technical work and writing was done by Rosella James, Chairman of the Statistics Department. Dr. Phillip Elkin, formerly of the Temple University Insurance Department, was chiefly responsible for collecting the data for the company sample, for Massachusetts, and for the Workmen's Compensation Program for New Jersey. John C. Sevier was responsible for handling the mail and oral interviews with victims and the coding and tabulation of responses. Other staff personnel who participated in this work were Emilia J. Laboda, Elizabeth Spera, and Myrna Moffson.

In acknowledging the cooperation and contributions of those named above, the writer recognizes that he must accept primary responsibility for the entire work and sole responsibility for the analytical judgments based upon the survey data presented herein.

John F. Adams
March 1, 1960

THE Bureau of Economic and Business Research of the Temple University School of Business and Public Administration was organized to provide a vehicle for stimulating and coordinating analytical studies. Its primary objectives include (1) service to the alumni as well as to the faculty and students of the University by bringing to their attention pertinent developments in the world of business, and (2) service to business and government by making contributions to the solution of specific problems. To this end, the Bureau both carries on specialized research and publishes quarterly the **Economics and Business Bulletin,** containing some of the significant results of its current studies.

The reader's appraisal of the **Bulletin** and comments upon it are solicited. The Bureau also will appreciate receiving suggestions and requests for particular studies.

The opinions and views expressed in the articles contained in this **Bulletin** are those of the writers and cannot be construed as the official opinions or policies of the School of Business and Public Administration.

A Comparative Analysis of Costs of Insuring
Against Losses Due to Automobile Accidents
Various Hypotheses — New Jersey, 1955

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CHAPTER I

Introduction

THE purpose of this study was to obtain specific information indicative of the scope and magnitude of both the economic and strictly defined financial losses resulting from fatal and nonfatal personal injuries and vehicular and other physical damage resulting from New Jersey automobile accidents, and to determine how and to what extent these losses were compensated. These data were used as a basis for preparing an objective comparative statistical study of the relative costs of compensating New Jersey automobile accident losses under (1) the present system of voluntary direct and liability insurance coverages, with a financial responsibility statute and an unsatisfied judgement fund, and including a cost allowance for losses not recovered; (2) compulsory liability coverage, as now provided under the Massachusetts law for bodily injury, and, by extension, for property damage, as well; and (3) a compensation program, with several alternative bases, as for example, a plan modeled on the workmen's compensation program now in use in New Jersey.

Approach and Content

This study was designed to utilize a known universe so that comparative analyses of different types of programs might be as accurate as possible. For this reason it was necessary to select a state universe to create a reasonably closed statistical model, and to accumulate detailed information concerning automobile accidents and their financial results. Since there was no source from which such data could be obtained other than the victims themselves and since resources were not available to permit any census of accident victims, it was necessary to design a sample of victims to represent the universe and to seek their aid in accumulating the necessary information.

To these ends the State of New Jersey was selected as the universe for study. Some time lapse was necessary to permit the results of the accidents to be known with reasonable certainty. Thus, since the surveys were to be undertaken during 1957, the accident year, 1955, was selected.

The records of the Traffic Safety Bureau became the primary source documents for identifying accidents for study. It was recognized immediately that, under the New Jersey law which requires reporting of accidents involving property damage of $100 or more and/or a bodily injury, the list of accidents would be something less than the universe of all accidents. To compensate for this, some efforts were directed at finding other references to automobile accidents, such as local traffic records, news clips, insurance claim reports and other similar sources. It was soon determined that no systematic reporting which could give a more accurate clue to all accidents while preserving reasonable statistical controls was available.

The State Traffic Bureau records, accordingly, became the sole source, and the data recorded in that Agency are used as the universe of New Jersey accidents. This decision created a statistical basis for the study which admittedly understated the universe. However, recognizing this fact — that the nonreported accidents are primarily those of little consequence and/or not involving personal injury — the results, though not complete, would seem to be adequate for the purposes of this study, especially since all comparisons are made on the basis of similar universes. Details of selection, survey, validation of results and the like are detailed elsewhere. (See Chapter 2.)

It may also be noted that subsequent investigation revealed certain other limitations in the accident reports as data sources. Primarily these had to do with classification, and, as such, have had little bearing on the primary results, costs incurred and sources and amounts of recovery. These limitations, together with resultant adjustments, are detailed subsequently.

Upon completion, because the victim response was small in some categories, it was deemed necessary to seek an additional source of data which might be used to validate some of the survey results. For this purpose a sample of insurance companies was asked to supply data on all claims filed for a specific period. These data were tabulated and compared with those from the victim sample and are used as an indication of the validity of the sample reports. Incidently, they have also been used as a separate matrix for cost purposes to provide an additional comparison in some areas. (See Chapter 3.)

These data form the basis for estimating the number and types of accidents, damage to vehicles and other property and bodily injuries and the resultant costs of accidents in New Jersey, the first essentials of a statistical model designed to present alternate means of dealing with losses. These data also reflect present financial recoveries, by source, and serve to indicate both victim and, to a lesser extent, insurance company experience. They are also an approximation to the present program experience in New Jersey, although no attempt has been made to evaluate them, as such.

To get at the effects of a compulsory liability law, experience in Massachusetts was studied. The results of accidents in 1955 were obtained and universes comparable to those for New Jersey were prepared as bases for modifying behavior and experience in the latter state for cost purposes. The details are set forth in Chapter 4.

To get at a basis for estimating costs, given a compulsory compensation plan, the New Jersey Workmen's Compensation Program, as it applied to vehicular accidents in 1955, was studied. Cost models were prepared for use with victim experience under several alternative provisions, as described in Chapters 4 and 5.

Another basis for a compensation plan was thought to exist in Saskatchewan, Canada. Accordingly that program was examined in some detail. Although it is not sufficiently comparable to be applicable without such substantial adjustment as to make detailed conclusions inappropriate, the broad outlines of the program are presented both as a matter of interest and to demonstrate that such a plan is functioning in a reasonably sound manner and to the apparent satisfaction of a populace. (See Chapter 4.)

Finally the pure premium costs of insurance and remaining out-of-pocket losses were computed for several variations of each hypothetical system tested. These data and the methods of developing them are presented and compared in Chapter 5.

It must be clear that this experimental study has, as its principal purpose a comparison of **pure premium** costs of providing total insurance under several alternative techniques. Although the data are not as precise as they might have been, given total and accurate reporting, they are suggestive of the relative costs and financial results to victims of accidents under these systems as they might conceivably exist in New Jersey. This is not to say that any of these will be adopted, nor is it an indication that any should be. It does provide a factual basis for comparing costs and relative performance which may serve as a basis for further discussion. Clearly, much additional study will be necessary to establish a complete brief for any of these systems if it is to serve as a basis for its adoption in any political universe.

CHAPTER II

Survey of Victims of 1955 New Jersey Automobile Accidents

THE sample of victims of 1955 New Jersey automobile accidents selected for study was drawn from the universe of traffic accidents reported to the Bureau of Traffic Safety[1] (Table 1). Victims include drivers, both injured and uninjured, and all other persons including passengers and pedestrians, reported injured.

The Traffic Safety Bureau summary classifies accidents as fatal, nonfatal, and property damage. Each of these classes is divided into the following types of accidents:

Motor vehicle with:

1. Pedestrian
2. Other motor vehicle
3. Railroad
4. Street car
5. Animal-drawn vehicle
6. Bicycle
7. Animal
8. Fixed object
9. Other object

Noncollision

10. Overturned in roadway
11. Ran off roadway
12. Other noncollision

Nonfatal Injury and Property Damage Accident Sample

A sample of nonfatal and property damage accidents was drawn from the Traffic Safety Bureau universe. The sample was assumed to be random even thought it was drawn systematically from the files by specified last digits of the Traffic Safety report number. The assumption of randomness was justified, because report numbers for nonfatal and property damage accidents had not been assigned in accordance with any plan. After the drawing was completed, proportions in the sample for the different types of accidents were compared with the corresponding proportions of the universe. No significant differences were found.[2]

The original sample was larger than desired. In addition, it was felt that sufficient information could be obtained on property damage accidents by sending questionnaires to a group proportionately smaller than the number of such accidents to the universe of total accidents. Cases in the original sample were, therefore, reduced by random selection to 2,352 accidents involving bodily injury and 1,240 with property damage only. Sample proportions were again compared with universe proportions to check the validity of the reduced sample. No significant differences were found.

Although nearly 11,000 detailed questionnaires were mailed, there were only about 9,000 valid nonfatal accident victims. (Appendix B). Of this total 6,500 were sent to persons involved in the 2,352 nonfatal bodily injury accidents and 2,500 to drivers of vehicles in the 1,240 property-damage-only accidents.[3]

[1]State of New Jersey, Department of Law Public Safety, Bureau of Traffic Safety, **Summary of Motor Vehicle Traffic Accidents, Form TS-R3**, Trenton, New Jersey, March, 1956. It must be noted that this is considerably less than the total universe of auto accidents. Accidents involving personal injury and/or damage in excess of $100 must be reported to the Department of Public Safety. Many are thus eliminated; others may be as well. In addition, some having less than $100 in property damage and no personal injuries were reported.

[2]The term "significant difference" refers to whether or not an observed difference might be expected because of sampling. A difference larger than that which might be expected according to the laws of probability is said to be "significant." A "significant difference" would cause doubt that the sample had been drawn from the known universe or would indicate that the sample might have been drawn incorrectly. See Appendix A for a more detailed explanation.

[3]In a number of cases victims indicated that they were alone at the time of the accident although one or more victim passengers were listed in the accident reports.

About 600 were sent to the survivors of victims of the 181 fatal accidents (Table 2.) A second mailing of the same questionnaire was sent to those not responding to the first. In a third mailing, a short post card form was sent to each remaining nonrespondent. (Appendix B.) Responses were 1,150 to the first mailing, 253 to the second, and 840 to the card.

The three mailings were checked against each other to determine whether or not the answers were significantly different. Tests indicated no significant differences between answers given in the first and second mailings. The card form had fewer comparable questions, but when questions could be compared, no significant differences were observed among answers. Since time of response seemed to make little or no difference in answers given, the responses to the three mailings were combined into one sample whenever questions were comparable.

In an effort to find out more about those persons who had not returned the forms, a random sample of 591 was drawn from the approximately 6,800 nonrespondents. Attempts were made to interview each victim personally. Of the 591, less than half could be located; and of those located, only 98 permitted the interviewers to ask questions. In general, answers to fewer questions were obtained in the oral than the mail interviews. Comparisons of answers given in the oral interviews with those on the mailed questionnaires, however, showed similar results. The 98 oral interviews were combined, therefore, with responses to the three mailings.

Although nothing can be stated definitely about answers that nonrespondents would have given, it is assumed in the analyses of sample results that nonrespondents would have given answers similar to those of respondents. The defense for such assumption lies in the fact that no significant differences were found among answers received from the first, the second, the third mailings and from the oral interviews, and in the fact that reported behavior in a company sample, drawn subsequently, also showed essentially the same results. (See Chapter 3.)

Fatal Accidents

A random sample of 181 accidents (25 percent) was drawn from the universe of 723 fatal accidents, and questionnaires were sent to all survivors. Only 12 responses were received. A second sample of 72 accidents was then drawn from the remaining 542 cases and attempts were made to interview personally all persons involved. Only nine survivors could be persuaded to answer the questions. The total of 21 questionnaires, some of which were incomplete, was too small to permit drawing conclusions. Statements concerning fatal accidents, therefore, were inferred from sources other than the fatal accident sample. Some of the costs and conclusions were drawn on the assumption that fatal accidents would have shown the same results as nonfatal respondents indicated. Others were based upon results of a study of a sample of insurance companies' experiences.[4]

NEW JERSEY AUTOMOBILE ACCIDENT VICTIM SAMPLE RESULTS

The New Jersey accident victim sample consisted of two parts, one concerning nonfatal injury accidents and the other, property damage only accidents. Questionnaires were sent to victims of the two types in proportions different from those in the universe. For example, property damage accidents were 64.5 percent[5] of the universe, but only 34.5 percent of the original mailing of the

[4]The companies comprising the insurance company sample, reported on in the next chapter, were asked to indicate all fatal accidents reported during the second quarter of 1955. See pp. 41-48.

[5]Percentages were computed from values shown in Table 1.

63,113 ÷ 97,854 = .645
1,240 ÷ 3,592 = .345
127,000 ÷ 223,000 = .570
2,500 ÷ 9,000 = .278
872 ÷ 2,500 = .349
1,469 ÷ 6,500 = .226
818 ÷ 1,983 = .412
872 ÷ 2,341 = .372

survey questionnaires. The number of persons involved in this type of accident was approximately 57.0 percent of the universe of victims, but only 27.8 percent of the sample. Even though a significantly larger percentage of the victims in each type of accident responded to the property damage only category (34.9 percent compared with 22.6 percent), the greater relative response was not sufficient to bring the property damage sample proportion as high as it was in the universe. Sample responses to property damage accidents were 41.2 percent of accidents and 37.2 percent of victims compared with universe percentages of 64.5 percent and 57.0 percent, respectively. These differences between sample and universe percentages have been taken into consideration throughout the analyses of sample results.

A tabulation of responses according to type of accident and the method of contacting the respondents is shown in Table 3. The disagreement in total numbers between nonfatal and property damage accidents, as listed in Table 2, results from the transfer of 72 accidents and 72 respondents from the original Traffic Safety Bureau classification of "property damage only" to "bodily injury" accidents, because the respondents stated that inuries had been sustained.[6]

Subclasses of accidents have been reduced from 12, as listed on the Traffic Safety Bureau report, to three: Vehicular, Pedestrian, and Other. This consolidation was made because: (1) division of responses into 12 categories would have yielded samples too small to permit conclusions, and (2) respondents were confused by the 12 classes and frequently classified the accident somewhat differently than it had been on the Traffic Safety Bureau report. The sample category of "Pedestrian" corresponds to the Traffic Safety Bureau "Pedestrian" class after adjustment (Table 5). "Vehicular" includes the Bureau report "Vehicle with Other Motor Vehicle," "Railroad Train," and "Street Car." All eight of the remaining types of accidents are included in the sample class "Other." Before any comparisons between sample and universe proportions were made, the universe was adjusted for the apparent differences between the Traffice Safety Bureau reports and respondents' answers.[7]

Table 4 shows the sample numbers by type of accident and by status (driver, passenger, and pedestrian) of the respondent. Most, 86.44 percent, of the respondents to the survey were drivers of vehicles; 10.11 percent were passengers; and 3.45 percent were pedestrians.

The Summary of Motor Vehicle Traffic Accidents, State of New Jersey, Department of Law Public Safety, for the year, 1955 (Table 1) was used as the basis for preparing adjusted universe numbers (Table 5). Values shown by the police report were changed to agree with respondents' answers as to type of accident and whether or not bodily injury had occurred as explained above. No alterations were made in fatal accidents, because the sample had so few respondents in this category that no conclusions

[6]It is notable that differences between the accident reports and victims' responses appear in a number of cases. The Traffic Safety report carries three classes of injury, based on seriousness of injury. These reports are often prepared at the scene of the accident or immediately thereafter by an officer or the victim. The diagnosis of injury under these circumstances is difficult and it appears that the judgment in many cases is either overcautious or extreme. Some of those in the category indicating that they were hurt but showing no visible signs, subsequently reported on the questionnaire that there were no injuries. Others reporting none at the time of the accident subsequently reported injury, in some few cases, serious injuries. Similarly, some reporting injury and showing visible signs of it subsequently reported it as minor or no injury.

[7]Admittedly the classification of the officer on the spot may have been more accurate than that of the respondent after the fact. However, not all reports were prepared by officers and details in many cases are not available to indicate who prepared the report. Accordingly, the respondents' indications were accepted. It is noteworthy that there is agreement, in general, on the three major classes. Differences are apparent most often in the "other" group. Whether or not this classification is accurate does not affect the basic accident cost patterns and, thus, does not impair results in cost terms, however.

TABLE 1
Total Number of Accidents and Persons Injured, as Reported to the Bureau of Traffic Safety, Classified by the Type of Accident, for the State of New Jersey, 1955

Type of Accident	Number of Accidents				Number of Persons Injured		
	Total	Fatal	Nonfatal	Property Damage	Total	Fatal	Nonfatal
Motor Vehicle and							
Pedestrian	5,496	234	5,262	--	5,677	235	5,442
Other Motor Vehicle	79,130	243	23,001	55,886	39,027	293	38,734
Railroad Train	127	13	56	58	97	16	81
Street Car	14	--	9	5	13	--	13
Animal Drawn Vehicle	9	--	6	3	17	--	17
Bicycle	1,009	14	994	1	1,070	15	1,055
Animal	153	1	21	131	28	1	27
Fixed Object	1,783	33	576	1,174	854	34	820
Other Object	109	--	35	74	46	--	46
Noncollision							
Overturned in Roadway	876	17	411	448	640	18	622
Ran off Roadway	9,463	156	4,020	5,287	6,030	167	5,863
Other Noncollision	408	12	350	46	407	12	395
Total	98,577	723	34,741	63,113	53,906	791	53,115

Source: State of New Jersey, Department of Public Law Safety, Bureau of Traffic Safety, Summary of Motor Vehicle Traffic Accidents, Form TS-R3, Trenton, New Jersey, March, 1956.

TABLE 2
Number of Questionnaires and Responses to the Survey of Victims of 1955 New Jersey Automobile Accidents, Classified by Nonfatal Bodily Injury and Property Damage Only Accidents

Questionnaires and Responses	Total	Type of Accidents[1] Nonfatal Injury	Property Damage
Original Mailing			
Number of Accidents	3,592	2,352	1,240
Number of Victims[2]	9,000	6,500	2,500
Number of Victims per Accident	2.51	2.76	2.02
Number of Responses			
First Mailing	1,150	773	377
Second Mailing	253	165	88
Third Mailing (Card)	840	469	371
Oral Interviews	98	62	36
Total	2,341	1,469	872
Number of Accidents	1,903	1,165	818
Responses per Accident	1.18	1.26	1.07
Universe			
Number of Accidents[3]	97,854	34,741	63,113
Number of Victims[4]	223,000	96,000	127,000

[1]Classified according to Traffic Safety Bureau records.
[2]Approximate, exclusive of fatal accidents (181).
[3]From Table 1.
[4]Computed from the number of victims per accident in the original mailing, as adjusted, multiplied by the number of universe accidents and rounded to the nearest thousand.

TABLE 3
Respondents to the Survey of Victims of 1955 New Jersey Automobile Accidents, Classified by Type of Accident Reported, and by Method of Contact

Type of Accident	Total	Method of Contact: Detailed Questionnaire Total	Mailed	Oral	Card Questionnaire
Combined Total[1]	2,341	1,501	1,403	98	840
No Response, Accident Type	151	59	44	15	92
Vehicular[2]	1,837	1,189	1,128	61	648
Pedestrian[3]	127	90	82	8	37
Other[4]	226	163	152	11	63
Nonfatal Bodily Injury[5]	1,541	1,043	981	62	498
No Response, Accident Type	58	22	10	12	36
Vehicular	1,193	810	774	36	383
Pedestrian	127	90	82	8	37
Other	163	121	115	6	42
Property Damage Only[5]	800	458	422	36	342
No Response, Accident Type	93	37	31	6	56
Vehicular	644	379	354	25	265
Pedestrian	--	--	--	--	--
Other	63	42	37	5	21

[1]In all subsequent tables, unless otherwise noted, the data based upon the full sample listed above as "Combined Total." Some tables are based upon respondents to the "detailed questionnaire," the subsample of 1,501 cases indicated above; others are based upon respondents to the card questionnaire, the 840 cases listed above.
[2]Vehicular accidents include all occurrences involving two or more powered vehicles, at least one of which was in operation at the time of the accident. (See text).
[3]Pedestrian accidents include all accidents involving pedestrians.
[4]"Other" accidents include all incidents not fitting the above definitions, and consist mainly of fixed object collisions and "run off the road" events.
[5]Seventy-two cases classified in the unadjusted Traffic Safety report as property-damage only accidents have been transferred to bodily-injury accidents, because respondents reported injuries. The police universe (Table 5) has been adjusted to responses. (See text for details.)

TABLE 4
Respondents to the Survey of Victims of 1955 New Jersey Automobile Accidents, Classified by the Type of Accident Reported and by Status of Respondents[1]

Type of Accident	Total	Status of Victim: Driver	Passenger	Pedestrian
Combined Total	2,146	1,855	217	74
No Response to Type	4	3	1	--
Vehicular	1,797	1,621	170	6
Pedestrian	125	66	4	55
Other	220	165	42	13
NonFatal Bodily Injury	1,452	1,161	217	74
No Response to Type	4	3	1	--
Vehicular	1,164	988	170	6
Pedestrian	125	66	4	55
Other	159	104	42	13
Property Damage Only	694	694	--	--
No Response to Type	--	--	--	--
Vehicular	633	633	--	--
Pedestrian	--	--	--	--
Other	61	61	--	--

[1]See footnotes to Tables 2 and 3 and text for an explanation

could be drawn in any case. Corrections pertaining to type of accident were made to agree with the respondents' classifications to facilitate tabulation, while changes as to whether the accident involved bodily injury or not were made on the assumption that the respondents would be better acquainted with the consequences of the accident at the time of the questionnaire than at the time of the accident.

For ease of use an adjusted universe has been prepared and is presented (Table 5) for comparison with the original data prepared by the Traffic Safety Bureau (Table 1). This is not designed to argue that the State reports are in error, but rather it is intended to indicate the results of a detailed follow-up which makes certain differences evident. As noted, this study is primarily concerned with costs of accidents and how they are, and/or might be, met, not a system of accident classification. The fact that classes differ somewhat in proportion does not affect the results, total costs, which have been validated by several different means as will be explained subsequently. The principal adjustments are outlined in the following paragraphs.

In accidents reported by the Traffic Safety Bureau as "nonfatal, pedestrian," 14.8 percent of the respondents classified the accident as "other" and 6.8 percent as "vehicular," while 21.6 percent of those remaining, who stated that the accident was "pedestrian," indicated that no injuries had been sustained by anyone involved in the accident.[8] These percentages were applied against the Traffic Safety Bureau universe of 5,262, with 778 accidents being transferred to "other" and 359 to "vehicular." Of the remaining 4,125, 891 (21.6 percent) were removed from injury accidents.

Of those respondents classifying accidents as "nonfatal, vehicular," and "nonfatal, other," 44.2 percent and 22.5 percent claimed that no one had been injured.[9] These percentages were applied against the universe; and it was adjusted for accident classification, 10,354 accidents being removed from "bodily injury, vehicular" and 1,618 from "bodily injury, other."

In accidents reported by the Traffic Safety Bureau as "property-damage only," 8.7 percent of those classified as "vehicular" and 19.7 percent of "other" reported bodily injuries resulting from the accident.[10] These percentages were multiplied by the Traffic Safety Bureau universe of property damage accidents in the amounts 55,949 and 7,164 respectively. The resulting values of 4,868 and 1,411 were then added to the bodily injury accidents.

Respondents answers to, "How many were injured or hospitalized as a result of the accident" (Table 13), were then used to determine the number injured per nonfatal injury accident. The resulting ratios (vehicular, 1.830; pedestrian, 1.066; and other, 1.786[11]) were applied against the adjusted universe numbers of accidents with nonfatal injuries to obtain the estimated number of injured. These same ratios were applied also against fatal accidents to approximate the total number both injured and killed. The number killed as indicated by the Traffic Safety Bureau report was deducted from the total injured and the remainder was used as the number nonfatally injured in such accidents. This procedure probably has resulted in an underestimate of the number injured, since it assumes that fatal accidents have the same ratio of injured, including fatalities, per accident, as do the nonfatal, whereas it appears

[8]Sample numbers were 162 for the first two percentages, and 127 for the 21.6 percent. See Appendix A for sampling errors.

[9]Sample numbers were 755 and 111, respectively.

[10]Sample numbers were 690 and 62.

[11]The sampling errors (.127, .114, and .234) were obtained by using the formula $2\left(\frac{S.}{\sqrt{N-1}}\right)$. These errors should be added to and deducted from the sample results to obtain the 95 percent confidence limits for the universe ratio. See Appendix A.

more likely that the ratio would be greater. However, the total number is so small relative to the total number injured that doubling the number would result in almost no change in the percentages and in only a few cents difference in per vehicle costs.

In general, all results based upon the New Jersey victim sample are hereafter stated in percentages. Unless otherwise stated, the percentages used in the following analysis are based only on those respondents answering the questions under consideration and are classified in accordance with the sample or universe, as adjusted. Since the numbers answering different questions vary, the size of the sample and, therefore, the sampling error varies with each question. Sampling errors represent differences which may be expected (according to the laws of probability) between sample values and the true values in the universe from which the samples were drawn. In general, the smaller the sample, the larger the sampling error. In each case the number in the sample is listed in the table. Appendix A contains an explanation and a table of sampling errors for various sizes of samples. Use of this table comparatively with the numbers given will indicate the probable error in each instance.

Vehicular Universe

The State of New Jersey, **Summary of Motor Vehicle Traffic Accidents**, mentioned earlier (Table 1), shows the total number of motor vehicles involved in accidents as 187,553, but it does not indicate the type of accident nor the number damaged. It does, however, show the numbers involved in fatal, nonfatal, and property damage only accidents as 1,054, 62,228, and 124,271.

The divisions among vehicular, pedestrian, and other types of accidents (Table 6) were obtained by using numbers of vehicles per accident, as indicated by the Traffic Safety Bureau reports on accidents covered by survey respondents. The analysis showed:

	Vehicles per Accident	
	Nonfatal	Property Damage
Vehicular	2.140	2.092
Pedestrian	1.000	—
Other	1.075	1.000

These were multiplied by the corresponding number of accidents to approximate the number of vehicles involved in each type of accident. The number of vehicles involved in property damage accidents (112,598) is smaller than that given on the original Traffic Safety Bureau report (124,271), because of adjustments to the universe of accidents for differences in the proportions with property damage and bodily injuries, as described earlier.

The numbers of vehicles damaged and with damage to property other than the vehicle itself were estimated from respondents answers to the questions, "If you were a driver or an owner of the vehicle involved in the accident, was there property damage to your car? Were there other property losses in the accident?" Percentages indicated were:

	With Damage to Vehicle		
	Nonfatal Bodily Injury	Property Damage Only	With "Other" Damage
Vehicular[1]	95.8%	96.4%	28.5%
Pedestrian[2]	30.0	—	—
Other[3]	90.5	89.7	41.9

To estimate the number of damaged vehicles, the above percentages were applied to the appropriate universe number of vehicles involved in nonfatal accidents. All vehicles involved in fatal accidents, however, were considered damaged. No division between bodily injury and property damage accident responses could be made for damages other than to the vehicle. It was assumed, therefore, that the same proportions would hold for both classifications, and the two types of respondents were combined. The computed percentages were then applied against the total number of vehicles in-

[1]Numbers in the samples were 430, 365 and 653.

[2]The sample number was 20. This obviously understates the actual, due to the size of the sample. Data from other related studies indicate that vehicular damage is sustained in a small proportion of the cases. See, for example, "Economic-Financial Consequences of Personal Injuries Sustained in 1953 Philadelphia Auto Accidents," **Economics and Business Bulletin**, March, 1955, pp. 92.

[3]Numbers in the samples were 42, 39, and 74.

volved, including those in fatal accidents, to approximate the number of vehicles associated with property damage other than to the vehicle.

ANALYSIS OF SAMPLE RESPONSES

Causes of Accidents and Police Charges

Causes, Fault, and Police Charges resulting from the sample of New Jersey accidents studied are summarized in Tables 7, 8, and 9. It has been assumed that all fatal, nonfatal, and property damage only accidents would have similar causes (Table 7) and that the sample proportions, as adjusted, apply to the derived state universe. This same assumption was made in selecting the universe for "fault" and for "police charges made" (Tables 8 and 9). Because total fatal accidents are relatively few, comparatively, the data in the latter case (Table 9) may be understated. However, inclusion of all fatal accidents in "charges made" would cause less than a one percent difference.

Cause of Accident. Causes of accidents were listed as: "mechanical failure, other driver," "mechanical failure, my car/driver," "weather and/or road conditions," "excessive speed," "failure to observe signal," "reckless driving," "insufficient clearance or poor driving," "drunk," "pedestrian ran into street," "fell asleep," and "other." (See Table 7.) The two most frequent causes of total accidents, which do not appear to be significantly different from each other, are "reckless driving" and "insufficient clearance or poor driving" for a total of 43.01 percent. The third and fourth most frequent are "weather and/or road conditions," 16.24 percent, and "failure to observe signal," 12.73 percent. It is interesting to note that three of the reasons given should be under control of the drivers, or that 55.74 percent of the accidents might possibly have been prevented by better driving.

In vehicular accidents, the first four causes are the same as those shown for all types of accidents with the first two totaling 46.61 percent, the third, 15.54 percent, and the fourth, 14.95 percent, or 61.56 percent resulting from what would appear to be inadequate care on the part of drivers. More than half, 55.13 percent of the pedestrian accident respondents gave "pedestrian ran into street" as the cause of the accident. In other accidents, the cause most often given was "weather and/or road conditions," 23.37 percent, with "reckless driving," 19.48 percent, a close, and not significantly different, second.

Within types of accidents, the causes "insufficient clearance or poor driving" and "failure to observe signal" are relatively more frequent for vehicular accidents than for pedestrian or other, while "pedestrian ran into street" is relatively greater for pedestrian accidents. For other accidents, "mechanical failure, my car/driver" and "fell asleep" are relatively more frequent causes than for the other two types of accidents.

Fault. The person or persons and/or conditions responsible for accidents are shown as: "other driver, entirely," "pedestrian," "my driver-or I, the driver," "joint responsibility," and "other." Respondents gave "other driver, entirely" in 59.31 percent of the cases with "my driver-or I, the driver," 15.58 percent, second. Under vehicular accidents, 67.09 percent, indicated that the other driver was at fault. In pedestrian accidents, 48.68 percent blamed the pedestrian with 28.32 percent listing the other driver and not a significantly different percentage, 18.58 percent, responding "joint responsibility." Under "other" accidents, "my driver-or I, the driver, entirely," in 36.94 percent, were listed as responsible, with the second and third not significantly different from each other or from the first shown as "other driver, entirely," 26.11 percent, and "joint responsibility," 21.68 percent. Since most of the "other" type accidents involved only one vehicle, the "other driver" may refer to the driver of a nonmotor vehicle or of a motor vehicle

TABLE 5

Number of Accidents and the Number of Persons Injured as Reported by the Bureau of Traffic Safety, Adjusted According to Responses to the Survey of Victims of 1955 New Jersey Automobile Accidents, Classified by Type of Accident[1]

Type of Accident	Number of Accidents					Number of Persons Injured			
			With Personal Injury	No Personal Injury	Property Damage		Fatal Accidents	Nonfatally Injured	Nonfatal Bodily Injury
	Total	Fatal				Total	Killed		
Combined Total	98,577	723	28,157	12,863	56,834	49,881	791	342	48,748
Vehicular	79,630	256	17,939	10,354	51,081	33,296	309	159	32,828
Pedestrian	4,359	234	3,234	891	--	3,696	235	14	3,447
Other	14,588	233	6,984	1,618	5,753	12,889	247	169	12,473

[1]See footnotes to Tables 1-4. See text for an explanation of methodology and the reasons therefore.

TABLE 6

Universe of Vehicles Involved in Accidents Adjusted According to Responses of Victims of 1955 New Jersey Automobile Accidents, Classified by Types of Accidents

Type of Accident	Involved in all Accidents	No Damage to Car	With Property Damage To:					
			Car			Other Than to Car[5]		
			Total	Fatal[3]	Other[4]	Total	Fatal	Other
Combined Total	187,553[1]	10,746	176,807	1,054	175,753	52,255	268	53,987
Vehicular	167,941	6,388	161,553	654	160,989	47,864	161	47,703
Pedestrian	4,359	2,887	1,472	234	1,238	--	--	--
Other	15,253	1,471	13,782	256	13,526	6,391	107	6,284
Bodily Injury	74,955[2]	6,307	68,648	1,054	67,594	21,393	268	21,125
Vehicular	61,096	2,542	58,554	564	57,990	17,413	161	17,252
Pedestrian	4,359	2,887	1,472	234	1,238	--	--	--
Other	9,500	878	8,622	256	8,366	3,980	107	3,873
Property Damage Only	112,598	4,439	108,159	--	108,159	32,862	--	32,862
Vehicular	106,845	3,846	102,999	--	102,999	30,451	--	30,451
Pedestrian	--	--	--	--	--	--	--	--
Other	5,753	593	5,160	--	5,160	2,411	--	2,411

[1]Source: State of New Jersey, Department of Public Law Safety, Bureau of Traffic Safety, Summary of Motor Traffic Accidents, Form TS-R3, Trenton, New Jersey, March, 1956.
[2]Differs from Traffic Safety report because of transferring "property damage only" accidents to "bodily injury" according to respondents answers.
[3]All vehicles involved in fatal accidents are assumed to have been damaged.
[4]Percentages derived from drivers' and owners' answers to property damage questions were applied to the total numbers of vehicles involved in nonfatal accidents as follows: Nonfatal bodily injury accidents--vehicular, 96.4%; other, 89.7%. The sample sizes were 430, 20, 42, 365, and 39, respectively.
[5]Since percentages for vehicular and other types of accidents in (4) above did not differ significantly between bodily injury accidents and property damage only, the combined total was used to obtain percentages used in the estimation of numbers of vehicles involved in accidents causing property damage other than to car. Percentages applied to all vehicles involved were: vehicular, 28.5%; pedestrian, 0.0%; other, 41.9%. The sample sizes were: vehicular, 653; pedestrian, 0; other, 74.

TABLE 7

Percentage Distribution of Accidents, Classified by Type of Accident and by Cause of Accident as Reported by the Respondents to the Survey of Victims of 1955 New Jersey Automobile Accidents (Detailed Questionnaire)

Cause of Accident	Type of Accident			
	Total[1]	Vehicular	Pedestrian	Other
Total[2]	100.00%	100.00%	100.00%	100.00%
Mechanical Failure, Other Driver	2.46	2.45	--	3.25
Mechanical Failure, My Car/Driver	2.41	1.67	--	7.14
Weather and/or Road Conditions	16.24	15.54	5.13	23.37
Excessive Speed	5.47	5.80	2.56	4.55
Failure to Observe Signal	12.73	14.95	3.85	3.25
Reckless Driving	21.72	22.62	12.82	19.48
Insufficient Clearance or Poor Driving	21.29	23.99	6.41	11.04
Drunk	2.06	2.36	1.28	0.65
Pedestrian Ran Into Street	2.81	0.10	55.13	1.95
Fell Asleep	2.19	0.98	1.28	9.09
Other	10.62	9.54	11.54	16.23

[1]The percentage of the total is derived from universe values after distributing within each type of accident according to the respondents' answers.
[2]Sample numbers were: Total, 1,249; Vehicular, 1,017; Pedestrian, 78; Other, 154. See Appendix A for sampling errors of percentages.

TABLE 8

Percentage Distribution of Accidents, Classified by Type of Accident and by Fault as Reported by the Respondents to the Survey of Victims of 1955 New Jersey Automobile Accidents

Cause of Accident	Type of Accident			
	Total[1]	Vehicular	Pedestrian	Other
Total[2]	100.00%	100.00%	100.00%	100.00%
Other Driver, Entirely	59.31	67.09	28.32	26.11
Pedestrian	2.61	.29	48.68	1.48
My Driver or I, the Driver	15.58	12.43	1.76	36.94
Joint Responsibility	11.18	8.85	18.58	21.68
Other	11.32	11.34	2.66	13.79

[1]The percentage of the total is derived from universe values after distributing within each type of accident according to the respondents' answers.
[2]Sample numbers were: Total, 2,045; Vehicular, 1,729; Pedestrian, 113; Other, 203. See Appendix A for sampling errors of percentages.

not damaged or otherwise associated with the accident except as to cause. Within types of accidents, as might be expected, relatively larger numbers indicated "other driver, entirely" for vehicular, "pedestrian" for pedestrian, and "my driver-or I, the driver" for other accidents.

Police Charges. No police charges (Table 9) were made in the majority (81.14 percent) of the accidents, although relatively more charges were made in "other" accidents than in vehicular (30 percent compared with 17 percent). Within types of accidents, there were relatively more cases in which the drivers of vehicles involved in "other" type accidents were issued one or more citations.

Insurance Carried

In analyzing the type of insurance carried, the total number of vehicles involved in accidents was used as the universe. Sample numbers include only primary respondents, passengers and victim dependents being omitted. A large percentage, 87.70 percent, carried some form of liability insurance, while a smaller proportion, 58.71 percent, carried collision insurance of some kind, and only 5.79 percent had neither. (See Table 10.) Some 59.1 percent carried medical payments in combination with liability coverages, in effect, accepting the idea that a direct coverage is certain, at least.

Significantly, 12.3 percent carried no liability insurance, although half of this group had either collision or comprehensive or both.

Age and Sex

The victims (Table 2), which include all persons injured and all drivers even though not injured, have been used as the basis for the analyses of victim age and sex. This universe was estimated by multiplying the victims per accident, as computed from the original sample questionnaire mailings times the number of universe nonfatal accidents. Proportions shown in the tables would be expected to differ from census figures which list all persons in the population and from Bureau of Traffic Safety reports which show only the injured. For example, in the sample only 26.01 percent of the victims were females, while in population counts approximately 50 percent would be. However, a female would not be included among the accident survey victims unless she had been a driver or had been injured. (See Table 12.)

The State of New Jersey, **Summary of Motor Vehicle Traffic Accidents,** shows 145,942 male drivers and 23,246 female drivers in those accident cases where sex was reported. The percentages of 86.26 percent and 13.74 percent, when compared with the sample percentages of 73.99 percent and 26.01 percent, suggest that a relatively higher number of women drivers, passengers, or pedestrians may have been injured as compared with men. Significantly larger proportions of males as compared with females were reported in all types of accidents, as might be expected. Within types of accidents, the sample yields no evidence that either sex has more of one type of accident than another since there are no statistically significant differences indicated among the results for the vehicular, pedestrian, and other types.

When ages are considered, again because of the definition of "victim," smaller proportions of children and older persons would be expected in the sample than either in total population or Traffic Safety reports because these data refer only to victims. It is interesting to note that the data show a relatively normal curve, though it is skewed slightly toward the younger ages. (See Table 11.) The largest proportion (25.91 percent) of victims are in the 26-35 age group, followed by the 36-45 age group (21.84 percent). Nearly the same proportion is evident for the 21-25 as for the 26-35 age group, if the difference in intervals is considered. It is likely that exposure helps to account for this fact, though youth may also be a factor. As pro-

TABLE 9

Percentage Distribution of Accidents, Classified by Type of Accident and by Police Charges Filed as Reported by the Traffic Safety Record on Respondents to the Survey of Victims of 1955 New Jersey Automobile Accidents

Police Charges	Combined Total	Type of Accident		
		Vehicular	Pedestrian	Other
Total[1]	100.00%	100.00%	100.00%	100.00%
No Charges Made	81.14	83.07	83.64	69.85
Total Charges	18.86	16.93	16.36	30.15
Charges Made				
Respondent issued one or more citations	5.46	3.25	8.18	16.74
Other party issued one or more citations	7.21	7.05	5.45	8.61
Both parties, or all parties including passengers issued one or more citations	3.57	3.98	--	2.40
Citation given but the nature not indicated	2.62	2.65	2.73	2.40

[1]Sample numbers were: total, 1,979; vehicular, 1,660; pedestrian, 110; other, 209.

TABLE 10

Numbers of Vehicles and Percentage Distribution of Types of Insurance Carried, as Reported by Respondents to the Survey of Victims of 1955 New Jersey Automobile Accidents[1]

Type of Insurance	Type of Insurance as a Percent of Total
Total	100.00%
$50 Deductible and Comprehensive	2.89
Over $50 Deductible and Comprehensive	.41
$50 Deductible, Comprehensive and Public Liability	9.41
Over $50 Deductible, Comprehensive and Public Liability	.78
$50 Deductible, Comprehensive, Public Liability, and Medical Payments	37.88
Over $50 Deductible, Comprehensive, Public Liability, and Medical Payments	4.13
Collision Only	3.21
Public Liability Only	11.42
Public Liability and Medical Payments	4.39
Public Liability and Comprehensive	6.98
Public Liability, Medical Payments and Comprehensive	12.71
No Coverage	5.79
Summary	
Collision, No Liability	6.51
Liability, No Collision	35.50
Both	52.20
Neither	5.79

[1]Based upon 1,935 responses by primary respondents or driver respondents. This includes 59 who did not answer the question "If you carry insurance, check the kind." No check presumably would indicate no insurance.

TABLE 11

Percentage Distribution of Victims, Classified by Age as Reported in the Accident Record of Respondents to the Survey of Victims of 1955 New Jersey Automobile Accidents

Age of Victim[1]	Percent of Total
Total	100.00%
Under 10 years	2.06[2]
10 to 20 years	13.00
21 to 25 years	12.81
26 to 35 years	25.91
36 to 45 years	21.84
46 to 55 years	13.82
56 to 65 years	7.15
66 to 70 years	2.02
Over 70 years	1.39

[1]Based on 2,004 records where data were available. See text.
[2]Probably undertakes the actual proportion since ages of victims were not given in some cases.

TABLE 12

Percentage Distribution of the Sex of Respondents to the Survey of Victims of 1955 New Jersey Automobile Accidents Obtained From the Traffic Safety Reports, Classified by Type of Accident

	Combined Total Percentages	Type of Accident		
		Vehicular	Pedestrian	Other
Combined Total[1]	100.00%	100.00%	100.00%	100.00%
Male	73.99	75.09	65.22	66.67
Female	26.01	24.91	34.78	33.33
Combined Total	100.00	87.22	4.53	8.25
Male[2]	100.00	88.49	4.24	7.27
Female[2]	100.00	84.48	5.17	10.35

[1]Sample numbers were: Total, 2,018; Vehicular, 1,690; Pedestrian, 115; Other, 213.
[2]Sample numbers were: Total, 2,018; Male, 1,486; Female, 532.

TABLE 13

Percentage Distribution of Nonfatal Bodily Injury Accidents, Classified by Type of Accident and by Number Injured as Reported by Respondents to the Survey of Victims of 1955 New Jersey Automobile Accidents[1]

Type of Accident	Total Nonfatal Bodily Injury	Number Injured		
		One	Two	Three or More
Combined Total[2]	100.00%	57.56%	22.95%	19.49%
Vehicular	100.00	52.60	25.78	21.62
Pedestrian	100.00	94.74	3.95	1.31
Other	100.00	53.06	24.49	22.45
Combined Total[3]	100.00	100.00	100.00	100.00
Vehicular	63.71	58.22	71.56	70.66
Pedestrian	11.49	18.91	1.98	.77
Other	24.80	22.87	26.46	28.57

[1]See Table 5 for total nonfatal bodily injury accidents.
[2]Sample numbers were: Total, 655; Vehicular, 481; Pedestrian, 76; Other, 98.
[3]Sample numbers were: Total, 655; One, 377; Two, 151; Three or more, 127.

portions of total population, the older age groups show higher rates relative to total population than are evident here, as would be expected, this table being based on the accident universe, not the population. The very young show some concentration in pedestrian type accidents while the old are spread more nearly normally over all accident types.

Number Injured

Respondents' answers to the question concerning the numbers injured were used to develop universe values (Table 5), as explained in the section **Adjustments to the Universe from Sample Results—Number of Accidents and Number Injured.** The computed number of accidents with nonfatally injured persons, thus, has been used as the universe and only those respondents who stated that injuries occurred are shown.

In all three types of accidents, more than half, 57.56 percent, of the accidents resulted in only one person being injured, with a significantly higher proportion of pedestrian accidents compared with the other two types having only one injured. The average numbers[12] injured per accident were: vehicular, 1.830; pedestrian, 1.066; other, 1.786.

Over-all, 63.7 percent of all bodily injury accidents were the result of vehicular incidents; 24.8 percent were from other accidents; and 11.49 percent involved vehicle-pedestrian incidents. (See Table 13.) Among those accidents in which one was injured 58.2 percent were vehicular; 18.9 percent, pedestrian; and 22.87 percent, other. Incidents involving two or more personal injuries in more than 70 percent of the cases were vehicular. Two injury accidents involved pedestrians in 1.98 percent of the cases while they were involved in only 0.77 percent of the three injury accidents. The remainder in both cases were other accidents.

Looking at these data from another standpoint, 52.6 percent of all vehicular accidents involving bodily injury had only one; 25.78 percent had two; and 21.62 percent showed three. A similar pattern emerges for other accidents, 53.06 percent of all injuries occurring in accidents involving one; 24.49 percent, two; and 22.45 percent, three. In pedestrian accidents, as would be expected, 94.74 percent of all injuries were in incidents in which only one was involved; 3.95 percent were in cases of two; 1.31 percent resulted from cases involving three or more injuries.

Nature of Injuries

Injuries reported by all victims were then obtained and identified by part of the body. It is interesting to note that multiple injuries, reported by 30.50 percent, and head injuries, 29.51 percent, not significantly different proportions, were the two types of injuries most often suffered. The other types of injuries, "torso," (14.04 percent) "arm," (8.2 percent) "leg," (8.47 percent) and "shock" (9.28 percent) were reported by relatively smaller numbers than were "multiple" and "head," injuries, but with the exception of the first, the results were not significantly different from each other. (See Table 14.)

Although observed percentages for different accident types within each kind of injury apparently vary greatly, because of the relatively small sizes of the sample in some categories, no statistically valid conclusion may be drawn concerning this point. However, the greater proportions of leg and multiple injuries in pedestrian accidents, which finding is similar to those of other studies, as for example, the earlier Philadelphia study conducted by this Bureau, suggest that these differences would have persisted had the samples been larger, and would indeed have been significant. This is logical in that lacking protection of any sort, the pedestrian apparently tends to sustain these types of injuries more frequently than other victims, and frequently with more serious consequences.

[12]Approximate sampling errors to obtain the 95 percent confidence limits for the average in the universe from which the samples were drawn are .127, .114, and .234 respectively.

Although observed percentages for the different types of accidents within each kind of injury apparently vary greatly because of the sizes of the samples, there is no evidence to indicate that the nature of injuries differs according to the type of accident. In fact, such evidence as exists in the cost data hereafter suggests their similarity both as to treatment and results.

Physician and Hospital Costs

In 81.32 percent of all cases of primary victims, physician and hospital costs reported were less than $200; in 49.56 percent of the cases they were less than $50.[13] Over-all, 93.25 percent reported such costs of less than $1,000. If one assumes $5,000 as the upper midvalue of the interval of $3,000 and over, average costs per primary victim injured in New Jersey, based on reported costs from the sample, would be: total, $311.19; vehicular, $292.57; pedestrian, $733.70; other, $290.79.[14] (See Table 15.) Although the observed difference between the average cost of pedestrian accidents and the averages for the other two types of accidents is large, this, because of the small sample size (33) is not significant. In other words, it is possible that the observed difference is due to sampling and that pedestrian injuries in the universe cost no more than injuries sustained in vehicular and other accidents. On the other hand, data from the 1953 Philadelphia study also suggested higher costs for pedestrians; and in this event the proportions were such that higher validity could be imputed to the results.[15]

Losses

Percentages of those having wage losses compared with primary respondents injured were: vehicular, 56.6 percent; pedestrian, 44.4 percent; other, 45.3 percent.[16] (See Table 16.) More than half of those with wage losses, 55.5 percent, reported wage losses of less than $200, while 93.2 percent indicated losses of less than $1,000. Were $5,000 assumed to be the midpoint of the interval of losses of $3,000 or more, the average loss per individual reporting wage losses would be: combined total, $443.86; vehicular, $284.94; pedestrian, $822.22; other, $905.43.[17] Even though the observed variation is large, the difference between the averages for vehicular and for pedestrian accidents is not statistically significant, although this experience is similar to that of other studies, as for example the Philadelphia study, cited above.[18] There is a significant difference, however, between wage losses for persons involved in vehicular and for those in other accidents, with losses from other accidents apparently being considered larger.

Other Losses

Primary respondents to this survey reporting other losses than physician and hospital bills and wages associated with their injuries, but not including property damage, were 80.2 percent, 48.1 percent, and 43.8 percent[19] of those primary respondents injured in nonfatal vehicular, pedestrian, and other accidents, respectively. (See Table 17.) These proportions were then applied to the adjusted universe of primary nonfatal injured to estimate the universe

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[13]The adjusted sample proportions instead of those from the Traffic Safety report were used for vehicular and other accidents. Had the latter been used, the percentage would have been 80.1 percent compared with the 78.2 percent actually used.

[14]Approximate sampling errors to obtain the 95 percent confidence limits are: $100, $120, $350, and $220.

[15]Temple University, Bureau of Economic and Business Research, **Loc. cit.**

[16]Sample numbers were: 212, 27, and 64. A few respondents who gave no amounts but indicated a loss were included in the computations.

[17]The approximate sampling errors to obtain 95 percent confidence limits for the universe averages are: $150, $170, and $550 and $350.

[18]Temple University, Bureau of Economic and Business Research, **Loc. cit.**

[19]Same as 16 above.

of those with other losses and, hence, costs incurred on this account. The reports show that such losses were under $100 in 49.63 percent of the cases, under $200 in 64.76 percent, and under $1,000 in 93.94 percent of all cases. Were it to be assumed that $5,000 is the midpoint of the loss interval of $3,000 and over, average losses per individual so injured would be: combined total, $344.97; vehicular, $257.93; pedestrian, $875.00; other, $668.77.[20]

Despite the large observed differences among the averages for the different types of accidents, because of the small sizes of the samples for pedestrian, (ten) and for other types of accidents, (26), all of the sample averages may have been drawn from universes with the same average losses. However, the relatively small proportions involved with this type of loss make it apparent that even if a maximum error were assumed in all cases, the effect on total losses (all types) would be slight. Thus, for example, if the data were adjusted to the maximum, the effect on average total cost would amount to less than one dollar per vehicle.

The other losses discussed above were stated by respondents as "automobile rent for another car," "clothing," "payment of fine," "business loss, unable to work," "continued physician visits for treatment," "continued physician visits, housekeeper hired," "bicycle repair," and "other." Inclusion of physician visits in this category results from the victims' statements. As a matter of fact, the items are questionable and are included here to permit segregation. No expense of automobile or other physical damage is included, except as stated. The majority of respondents, 63.07 percent, indicated that the loss resulted from renting another car. (See Table 17.)

[20]Approximate sampling errors to obtain the 95 percent confidence limits are: $120, $80, $530, and $330.

Losses from Dependents' Injuries

The universe for "Total Losses from Dependents' Injuries," represents the proportion of primary respondents, as shown by the sample, to the universe of victims in nonfatal injury accidents reporting dependents injured (13.5 percent).[20] (See Tables 2 and 18.) The total value was distributed to the three types of accidents in proportion to the number of dependents injured in each type. Number of dependents injured was obtained by taking the difference between total number injured (Table 5) and the number of primary individuals injured as computed for "Physician and Hospital Costs of Own Injuries" in Table 15. The number of dependents injured per primary individual with injured dependents was approximately 1.16.

Costs reported in this table, it should be noted, are not those per dependent. They are costs on account of dependents reported by primary victims, per primary respondent with one or more injured dependents. Because of the small samples within each cost category and, therefore, the relatively large sampling errors, there is no evidence of significant differences among the three types of accidents within cost intervals. For all types of accidents, however, there are sufficiently large proportions of respondents to produce significant results. The over-all data show that 55.01 percent, have costs of less than $200; 74.56 percent, less than $500; and 80.88 percent, less than $1,000. The use of $5,000 as the midvalue of the loss interval of $3,000 and over yields a combined mean of $654.99 per primary respondent with injured dependents or $566.72 per dependent. The approximate sampling error to obtain the 95 percent confidence limits for the universe from which the sample was drawn is $150, i.e. the loss would be between approximately $600 and $800 per primary victim having injured dependents.

TABLE 14
Percentage Distribution of Nonfatal Bodily Injury Victims, Classified by Type of Accident and by Nature of Injury Sustained as Reported by Respondents to the Survey of Victims of 1955 New Jersey Automobile Accidents

Nonfatal Injury	Combined Total	Type of Accident: Vehicular	Pedestrian	Other
Total[1]	100.00%	100.00%	100.00%	100.00%
Head	29.51	28.80	26.32	32.25
Torso	14.04	17.72	2.63	7.53
Arm	8.20	8.23	2.63	9.68
Leg	8.47	6.96	18.42	9.68
Multiple	30.50	28.48	39.47	33.33
Shock	9.28	9.81	10.53	7.53
Total[2]	100.00	67.34	7.07	25.59
Head	100.00	65.73	6.30	27.97
Torso	100.00	84.96	1.33	13.71
Arm	100.00	67.55	2.27	30.18
Leg	100.00	55.37	15.38	29.25
Multiple	100.00	62.88	9.15	27.97
Shock	100.00	71.21	8.03	20.76

[1]Sample numbers were: Total, 447; Vehicular, 316; Pedestrian, 38; Other, 93.
[2]Sample numbers were: Total, 447; Head, 131; Torso, 64; Arm, 36; Leg, 38; Multiple, 136; Shock, 42.

TABLE 15
Percentage Distribution of Primary Nonfatal Bodily Injury Victims, Classified by Type of Accident and by Total Physician and Hospital Costs as Reported by the Respondents to the Survey of Victims of 1955 New Jersey Automobile Accidents (Detailed Questionnaire)

Total of Physician and Hospital Costs	Combined Total	Type of Accident: Vehicular	Pedestrian	Other
Combined Total[1]	100.00%	100.00%	100.00%	100.00%
Under $50.00	49.56	49.19	26.08	54.39
$50.00 - $99.99	13.54	16.76	13.04	5.27
$100.00 - $199.99	18.22	18.92	21.74	15.79
$200.00 - $299.99	3.07	2.16	4.34	5.26
$300.00 - $499.99	4.10	3.24	--	7.02
$500.00 - $749.99	3.26	2.16	8.70	5.26
$750.00 - $999.99	1.50	1.62	8.70	--
$1,000.00 - $1,499.99	1.67	.54	8.70	3.51
$1,500.00 - $1,999.99	1.50	2.16	--	--
$2,000.00 - $2,999.99	.84	.54	--	1.75
$3,000.00 - and over	2.71	2.70	8.70	1.75

[1]Sample numbers were: Total, 265; Vehicular, 185; Pedestrian, 23; Other, 57

TABLE 16
Percentage Distribution of Nonfatal Bodily Injury Victims, Classified by Type of Accident and by Wage Losses as Reported by the Respondents to the Survey of Victims of 1955 New Jersey Automobile Accidents (Detailed Questionnaire)

Wage Losses	Combined Total	Type of Accident: Vehicular	Pedestrian	Other
Total[1]	100.00%	100.00%	100.00%	100.00%
Under $50.00	28.97	25.23	--	13.04
$50.00 - $99.99	13.14	15.91	11.11	4.35
$100.00 - $199.99	13.40	13.63	11.11	13.04
$200.00 - $299.99	8.37	6.82	11.11	13.04
$300.00 - $499.99	15.64	14.77	22.23	17.39
$500.00 - $749.99	8.37	6.82	11.11	13.04
$750.00 - $999.99	5.31	4.54	--	8.70
$1,000.00 - $1,499.99	.40	--	11.11	--
$1,500.00 - $1,999.99	1.38	--	11.11	4.35
$2,000.00 - $2,999.99	2.22	1.14	11.11	4.35
$3,000.00 - and over	2.80	1.14	--	8.70

[1]Sample numbers were: Total, 120; Vehicular, 88; Pedestrian, 9; Other, 23.

TABLE 17
Percentage Distribution of Nonfatal Bodily Injury Victims, Classified by Type of Accident and by Other Losses and by Nature of Other Losses as Reported by the Respondents to the Survey of Victims of 1955 New Jersey Automobile Accidents (Detailed Questionnaire)

Other Losses	Combined Total	Type of Accident: Vehicular	Pedestrian	Other
Total[1]	100.00%	100.00%	100.00%	100.00%
Under $50.00	20.90	22.07	20.00	15.39
$50.00 - $99.99	28.73	31.03	20.00	19.24
$100.00 - $199.99	15.13	17.24	--	7.69
$200.00 - $299.99	8.32	7.59	10.00	11.54
$300.00 - $499.99	10.92	9.65	20.00	15.38
$500.00 - $749.99	5.89	4.14	--	15.38
$750.00 - $999.99	4.05	3.45	--	7.69
$1,000.00 - $1,499.99	2.26	2.07	20.00	--
$1,500.00 - $1,999.99	.55	.69	--	--
$2,000.00 - $2,999.99	1.66	2.07	--	--
$3,000.00 - and over	1.59	--	10.00	7.69
Nature of Other Losses				
Total[2]	100.00%	100.00%	100.00%	100.00%
Auto Rent for Another Car	63.07	65.38	--	63.33
Clothing	5.87	4.49	20.00	10.00
Payment of Fine	8.11	8.33	10.00	6.67
Business Loss, Unable to Work	4.81	3.85	20.00	6.67
Continued Physician Visits for Treatment	10.00	10.26	40.00	3.33
Continued Physician Visits, Housekeeper Hired	2.88	3.21	10.00	--
Bicycle Repair	2.18	.64	--	10.00
Other	3.08	3.84	--	--

[1]Sample numbers were: Total, 181; Vehicular, 145; Pedestrian, 10; Other, 26.
[2]Sample numbers were: Total, 196; Vehicular, 156; Pedestrian, 10; Other, 30.

Sources Used to Cover Bodily Injury Losses

Proportions, time required to receive settlement, and the sources of funds used to cover bodily injury losses are shown in Table 19. The sources listed were categorized as follows: (1) respondents' own insurance; (2) other party's insurance; (3) other party personally; (4) the respondent personally; (5) temporary disability or unemployment insurance; (6) Workmen's Compensation; and (7) other or unknown. The percentages indicate the relative proportions of persons using the sources, not the amounts received. Since some persons used several sources, the total, all sources, represents not the actual number of respondents but the number of answers. For example, there were 713 sources reportedly used by the approximately 400 respondents.

The two most frequently used sources (not significantly different from each other) were "the other party's insurance," 34.64 percent, and "respondent's own insurance," 33.80 percent. The third most frequent source was "the respondent personally," 21.46 percent. The category "other or unknown sources" probably should be added to "respondent personally," to produce a total of 23.14 percent of all sources being the victim himself, because an analysis of information in Table 20 shows that the miscellaneous class consists mainly of funds obtained by borrowing or payments by the respondents' families. (See Table 19.)

Proportions were then divided into "less than half" and "more than half." The times required to receive funds were divided into: (1) no time; (2) under six months; (3) six to 12 months; (4) 12 to 24 months; and (5) more than 24 months. A relatively larger proportion received the funds in under six months from their own and the other party's insurer, and in "no time" from the respondent personally. It is worth noting that 78.68 percent of those who reported source used for defraying expenses of accidents recovered more than half of their reported losses. This is heavily weighted by the recoveries from "own insurance," 80.08 percent, and "other party's insurer," 86.64 percent.[21] Where the respondent bore some part of his own loss, in 77.12 percent of the cases it amounted to more than half of the costs. In all cases, other than "other party," 20.0 percent, more than half of the cost was borne by the respondent personally. Well over half, 67.22 percent, of recoveries from "own insurer" and 64.78 percent of recoveries from "other party's insurer" required less than six months. A little more than 1.0 percent required more than two years.[22] Altogether, 9.54 percent of those who recovered required more than six months. Some 38.85 percent did not specify any time, but many of the group were involved in litigation or disputes concerning value and may be assumed to have required more than six months. However, an exact distribution of this group, by time required for settlement, is not possible.

Additional information as to types of "own insurance" and "other" sources is given in Table 20. Again, as in Table 19, the percentages represent neither dollar values nor respondents, but numbers of answers. The most frequently used "own insurance" was "medical payments, auto," 47.46 percent, with the next most used single source being "Blue Cross/Blue Shield," 13.98 percent. "Other sources" could be included in "respondent personally" since these were primarily borrowed funds or family contributions.

Losses from Damages to Car

The majority of all reported losses from damages to the car (56.15 percent)

[21] A frequent response in these cases for "own insurance" was "recovered all" or "most of the cost."

[22] It should be noted that this does not include any cases in which no recovery took place. However, it does include those cases where the respondent admitted fault and, hence, personal responsibility and paid most of his own losses, recovery being restricted to payments from his own insurer.

TABLE 18
Percentage Distribution of Nonfatal Bodily Injury Victims, Classified by Type of Accident and by Total Losses of Victims from Dependents' Injuries as Reported by Respondents to the Survey of 1955 New Jersey Automobile Accidents

Losses on account of Dependents	Primary Victims with Injured Dependents by Type of Accident[1]			
	Total	Vehicular	Pedestrian	Other
Total[2]	100.00%	100.00%	100.00%	100.00%
Under $100	38.11	41.82	33.34	31.58
$100 - $199.99	16.90	9.09	33.33	26.31
200 - 299.99	9.00	12.74	--	5.26
300 - 499.99	10.55	17.27	--	--
500 - 749.99	4.66	3.64	--	10.53
750 - 999.99	1.66	2.72	--	--
1000 - 1499.99	3.55	1.82	--	10.53
1500 - 1999.99	4.56	5.46	--	5.26
2000 - 2999.99	6.91	2.72	33.33	--
3000 and over	4.10	2.72	--	10.53

[1]The average number of dependents injured per respondent is 1.16.
[2]Sample numbers were: Total, 132; Vehicular, 110; Pedestrian, 3; Other, 19.

TABLE 19
Percentage Distribution, Classified by Proportion, Time and Sources of Funds Used to Cover Nonfatal Bodily Injury Losses as Reported by Respondents to the Survey of Victims of 1955 New Jersey Automobile Accidents (Detailed Questionnaire)[1]

Percentages of Proportion and Time	Sources Used to Cover Losses[2]							
	Total	1	2	3	4	5	6	7
Total[3]	100.00%	33.80%	34.64%	3.93%	21.46%	2.17%	2.38%	1.68%
Less than 1/2 Total	100.00	31.58	21.71	7.89	23.03	7.89	4.61	3.29
No Time Specified	100.00	25.61	13.41	7.32	39.02	7.32	4.88	2.44
Under 6 months	100.00	47.91	25.00	6.25	4.17	6.25	6.25	4.17
6 to 12 months	100.00	27.27	45.46	--	9.09	9.09	--	9.09
12 to 26 months	100.00	--	50.00	37.50	--	12.50	--	--
More than 24 months	100.00	33.34	33.33	--	--	33.33	--	--
More than 1/2 Total	100.00	34.40	38.15	2.85	21.03	.54	1.78	1.25
No Time Specified	100.00	24.10	17.95	4.10	49.74	1.03	1.03	2.05
Under 6 months	100.00	43.44	46.25	2.19	5.00	.31	2.19	.62
6 to 12 months	100.00	36.84	52.63	5.27	--	--	5.26	--
12 to 24 months	100.00	--	90.90	--	4.55	--	--	4.55
More than 24 months	100.00	--	20.00	--	80.00	--	--	--
Percentages of Source Total[4]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Less than 1/2 Total	21.32	19.92	13.36	42.86	22.88	80.00	41.18	41.67
No Time Specified	11.50	8.71	4.45	21.43	20.92	40.00	23.53	16.67
Under 6 months	6.73	9.54	4.86	10.72	1.31	20.00	17.65	16.67
6 to 12 months	1.55	1.25	2.03	--	.65	6.67	--	8.33
12 to 24 months	1.12	--	1.62	10.71	--	6.67	--	--
More than 24 months	.42	.42	.40	--	--	6.66	--	--
More than 1/2 Total	78.68	80.08	86.64	57.14	77.12	20.00	58.82	58.33
No Time Specified	27.35	19.50	14.17	28.57	63.40	13.33	11.76	33.33
Under 6 months	44.88	57.68	59.92	25.00	10.46	6.67	41.18	16.67
6 to 12 months	2.66	2.90	4.05	3.57	--	--	5.88	--
12 to 24 months	3.09	--	8.09	--	.65	--	--	8.33
More than 24 months	.70	--	.41	--	2.61	--	--	--

[1]There were also 453 responses on the card questionnaire not giving proportion or time, but indicating sources of: 1, 35.76; 2, 32.89; 3, 2.65; 4, 19.87; 5, .44; 6, .44; 7, 7.95. These percentages are not significantly different from those on the detailed questionnaire.
[2]Sources used to cover losses were: 1. Respondent's Own Insurance, 2. The Other Party's Insurance, 3. The Other Party Personally, 4. The Respondent Personally, 5. Temporary Disability or Unemployment Insurance, 6. Workmen's Compensation, 7. Other and Unknown Sources.
[3]The numbers of answers received were: Total, 713; Less than 1/2 Total, 152 (No time, 82; Under 6 months, 48; 6 to 12 months, 48; 12 to 24 months, 8; more than 24 months, 3). More than 1/2 Total, 561 (No time, 195; Under 6 months, 320; 6 to 12 months, 19; 12 to 24 months, 22; more than 24 months, 5).
[4]The numbers of responses indicating sources were: Total, 713; 1, 241; 2, 247; 3, 28; 4, 153; 5, 15; 6, 17; 7, 12. The number of respondents (approx. 400) is less than the number of responses (713) because many respondents used more than one source. In addition to the number shown, there were 89 answers (approximately 44 respondents) who indicated the source but not the proportion or time. These were distributed by sources as follows: 1, 38.20; 2, 14.61; 3, 11.24; 4, 22.47; 5, 3.37; 6, 4.49; 7, 5.62.

were between $100.00 and $499.99. Altogether, more than three-quarters of all losses reported (77.24 percent) were under $500. A significantly higher proportion (53.42 percent) of other as compared with vehicular accidents (20.37 percent) were in brackets over $500 and in the category "total loss." The arithmetic means of reported losses on account of damage to vehicles were:[23] over-all, $354.76; vehicular accidents, $334; pedestrian accidents, $41.67; other accidents, $630.48. (See Table 21.) The means of the three types of accidents are significantly different from each other, and, therefore, it may be assumed that greater losses occur in other than in the vehicular accidents category, both of which result in greater damage to the car than pedestrian accidents. Two assumptions were made in order to compute these means: the midvalue of the highest interval was assumed to be $2,500, and the average loss on cars shown as total loss was assumed to be $500. Medians for the three types of accidents were: vehicular, $274.79; pedestrian, $50; other, $578.13.

A further check on loss figures may be obtained from repair cost data. In general, the information given by respondents for repair costs agrees with losses. However, since those vehicles listed as total losses were not repaired, average losses for costs to repair cars would be lower than those for total damages. In addition to those vehicles damaged beyond repair, some vehicles though damaged may not have been repaired at all if they were still useable. The arithmetic means, again using $2,500 as the midvalue of the interval $1,500 and over, were: total, $307.50; vehicular, $292.80; pedestrian, $70.83; other, $543.06. The medians were: vehicular, $210.42; pedestrians, $66.67; other, $393.33. (See Table 22.)

Table 23 summarizes the estimation of costs of losses on property other than automobiles. Over half, 51.40 percent, of all such losses were less than $200 and only 9.63 percent were in excess of $750. The arithmetic means, using $2,500 as the midvalue of the interval of $1,500 and over, were: fatal, $361.67; vehicular, $367.88; other, $314.52, with sampling errors for 95 percent confidence limits for the mean of the universe of approximately $40, $50 and $110, respectively. The medians were: vehicular, $204.55 and other, $125. Among the victims pedestrian accidents resulted in no other than car property losses.

Sources Used to Cover Property Damage Losses

The sources used to cover property damage losses were listed as: "own collision insurance," "other party's insurer," "other party himself," "both other party and his insurer," and "did not collect." Percentages should be used with caution because of the mixed losses. (See Table 24.) For example, although 39.54 percent used their own collision insurance, such insurance is usually written subject to a deductible which is to be paid by the car owner before any insurance payments are made. These percentages probably should be adjusted to relate to the cost data shown in the property damage material, earlier. Were this done, adjusted percentages would show losses not collected as 29.8 percent of total damages rather than 19.36 percent as seen in Table 24. Similarly this would reduce the percentage of losses collected from own insurance to 29.1 percent, if all vehicles are assumed to have had $50 deductible collision insurance.[24] Such adjustments are not necessary where own insurance was not used. For example, 36.14 percent of the respondents having property damage losses collected from the other party's insurer while 4.09 percent collected from the other party, and .87 percent from both. Over-all 19.36 percent did not collect

[23]The approximate sampling errors to obtain the 95 percent confidence limits for the mean of the universe from which the samples were drawn are: $30, $30, $20, and $100.

[24]The data used in estimating costs, subsequently were adjusted to reflect the deductible. See pp. 37-39.

TABLE 20

Percentage Distribution of Type of Own Insurance and Other Sources Used to Cover Nonfatal Bodily Injury Losses, Classified by Type of Accident, as Reported by Respondents to the Survey of Victims of 1955 New Jersey Automobile Accidents (Detailed Questionnaire)

Sources Used	Type of Accident[1] Categories as Percent of Total: Total	Vehicular	Pedestrian	Other
Own Insurance and Other Sources[2]	100.00%	74.21%	7.54%	18.25%
Own Insurance	100.00	74.58	7.20	18.22
Other Sources	100.00	68.75	12.50	18.75
Own Insurance	100.00	74.58	7.20	18.22
Life	100.00	87.50	12.50	--
Medical Payments, Auto	100.00	80.36	1.78	17.86
Blue Cross/Blue Shield	100.00	72.73	12.12	15.15
Personal Accident and Health	100.00	45.45	9.09	45.46
Medical Payments, Auto; Blue Cross/Blue Shield	100.00	68.18	9.09	22.73
Medical Payments, Auto; Blue Cross/Blue Shield; Personal Accident and Health	100.00	100.00	--	--
Blue Cross/Blue Shield; Personal Accident and Health	100.00	80.00	20.00	--
Medical Payments; Auto; Personal Accident and Health	100.00	42.86	--	57.14
Other Insurance (Union, Employer Group, Other)	100.00	72.22	16.67	11.11
Other Sources	100.00	68.75	12.50	18.75
Borrowed	100.00	85.71	14.29	--
Family	100.00	42.86	14.28	42.86
Other	100.00	100.00	--	--
	Percent Distribution Within Categories			
Own Insurance and Other Sources[2]	100.00%	100.00%	100.00%	100.00%
Own Insurance	93.66	94.12	89.47	93.48
Other Sources	6.34	5.88	10.53	6.52
Own Insurance	100.00	100.00	100.00	100.00
Life	3.39	3.98	5.88	--
Medical Payments, Auto	47.46	51.14	11.77	46.51
Blue Cross/Blue Shield;	13.98	13.64	23.53	11.63
Personal Accident and Health	4.66	2.84	5.88	11.63
Medical Payments, Auto; Blue Cross/Blue Shield	9.32	8.52	11.77	11.63
Medical Payments, Auto; Blue Cross/Blue Shield; Personal Accident and Health	.85	1.14	--	--
Blue Cross/Blue Shield; Personal Accident and Health	2.12	2.27	5.88	--
Medical Payments, Auto; Personal Accident and Health	2.97	1.70	--	9.30
Other Insurance (Union, Employer Group, Other)	15.25	14.77	35.29	9.30

[1]Sample numbers were: Total, 252; Vehicular, 187; Pedestrian, 19; Other, 46.

[2]Sample numbers were (reading from the top of the page down): 252, 236, 16, 236, 8,112, 33, 11, 22, 2, 5, 7, 36, 16, 7, 7, 2.

TABLE 20 (Continued)

Sources Used	Type of Accident[1] Percent Distribution Within Categories: Total	Vehicular	Pedestrian	Other
Other Sources	100.00%	100.00%	100.00%	100.00%
Borrowed	43.75	54.55	50.00	--
Family	43.75	27.27	50.00	100.00
Other	12.50	18.18	--	--

[1]Sample numbers were: Total, 252; Vehicular, 187; Pedestrian, 19; Other, 46.

[2]Sample numbers were (reading from the top of the page down): 252, 236, 16, 236, 8,112, 33, 11, 22, 2, 5, 7, 36, 16, 7, 7, 2.

TABLE 21

Percentage Distribution of Vehicles Damaged in Nonfatal and Property Damage Accidents, Classified by Type of Accident and by Losses from Damages to Car as Reported by the Respondents to the Survey of Victims of 1955 New Jersey Automobile Accidents (Detailed Questionnaire)

Damages	Type of Accident: Total	Vehicular	Pedestrian	Other
Total[1]	100.00%	100.00%	100.00%	100.00%
Under $50.00	8.99	9.07	66.67	2.74
$50.00 - $99.99	12.10	12.61	33.33	4.11
$100.00 - $199.99	20.87	22.21	--	6.85
$200.00 - $299.99	14.31	14.58	--	12.33
$300.00 - $499.99	20.97	21.16	--	20.55
$500.00 - $749.99	9.03	8.94	--	10.96
$750.00 - $1,499.99	5.62	4.99	--	13.70
$1,500.00 - and over	1.61	1.18	--	6.85
Total loss	6.50	5.26	--	21.91

[1]Sample numbers were: Total, 837; Vehicular, 761; Pedestrian, 3; Other, 73.

TABLE 22

Universe of Numbers and Percentage Distribution of Vehicles Damaged in Nonfatal and Property Damage Accidents, Classified by Type of Accident and by Costs to Repair Car as Reported by the Respondents to the Survey of Victims of 1955 New Jersey Automobile Accidents (Detailed Questionnaire)

Costs to Repair Car	Type of Accident: Total	Vehicular	Pedestrian	Other
Total[1]	100.00%	100.00%	100.00%	100.00%
Under $50.00	9.53	9.88	33.33	1.85
$50.00 - $99.99	13.11	13.21	50.00	7.41
$100.00 - $199.99	24.06	25.17	16.67	9.26
$200.00 - $299.99	16.68	16.69	--	18.52
$300.00 - $499.99	22.97	22.81	--	27.78
$500.00 - $749.99	7.69	7.51	--	11.11
$750.00 - $1,499.99	5.19	4.03	--	22.22
$1,500.00 - and over	.77	.70	--	1.85

[1]Sample numbers were: Total, 779; Vehicular, 719; Pedestrian, 6; Other, 54.

from any source. A significantly larger proportion, 60.77 percent, of those involved in other accidents used their own collision insurance as compared with 37.75 percent of those involved in vehicular accidents.

Counsel, Settlement Mode, and Judgment

Since the questions on counsel, settlement mode, and judgment were preceded by the statement, "Concerning your claim against the other party or his insurer," it is believed that only those who felt they had a claim would answer. If all respondents had been requested to answer, the percentages hiring lawyer and receiving settlement would have been much smaller. Both property-damage only and nonfatal bodily injury victims answered the questions. Because a smaller proportion of questionnaires had been sent to property-damage only victims, the percentages were weighted in order to obtain proper proportions in the combined total. The weights of 1.32 to 1 used for property-damage only and for nonfatal bodily injury victims, respectively, were computed from the estimated total number of victims in the two universes as shown in Table 2. (See Table 25.) Bodily injury victims may have suffered property damage in addition to injury.

A larger proportion of nonfatal bodily injury victims hired lawyers, 50.71 percent, and did so before any offer of settlement, 31.90 percent, compared with those who sustained only property damage, 23.03 percent and 11.40 percent. On the other hand, a larger percentage of property damage victims (86.01 percent) than bodily injury victims (67.24 percent) settled without suit. Of those who settled with suit, a larger proportion of bodily injury respondents settled with trial, 17.11 percent compared with 5.54 percent of the property damage only victims, and a larger percentage received judgments in favor of the victim, 85.00 percent compared with 57.89 percent. (See Table 25.)

Of those respondents who pressed claims against the other party, 72.51 percent accepted the first offer of settlement. Within the three accident type categories, the proportions accepting and rejecting the first offer were not significantly different. (See Table 26.) The most frequently noticed reason for rejecting the first offer was that it was "too small," the response of 71.71 percent of all who took this action. The second and third reasons, with 7.89 percent and 7.24 percent, respectively, were "too early to know extent of loss," and "thought could get more." (See Table 26.)

A tabulation showing the size of first offer and first settlements was then prepared. (See Table 27.)

There is an obvious overlap between the groups of first offers and the final settlements, because the values of the first offers were also the amounts of the final settlements in the 72.4 percent of the cases where the first offer was the final settlement and in some others where the first and final offers were both the same. Comparison of the two tabulations for statistically significant differences indicates that there are none. (See Table 27.) However, the fact that the observed percentages are smaller in the two lowest value intervals and consistently higher in all but one of the other value intervals for the final offer distribution as compared with that for first offer suggests higher final settlements in many of these cases. The median interval, however, for both first and final offer settlements falls in the $200.00 - $299.99 category.

Sizes of Settlements by Category

Because many insurers settle claims in totals rather than by item, an attempt was made to get a distribution of the settlement amount by purpose. In a number of cases this was not possible since no distribution was available. In other cases the individual undoubtedly distributed the amount in accord with his use of the funds. Where an itemiza-

TABLE 23

Percentage Distribution of Vehicles Causing Damage to Property Other than the Car, Classified by Type of Accident and Costs of Other Property Damage as Reported by the Respondents to the Survey of Victims of 1955 New Jersey Automobile Accidents (Detailed Questionnaire)

Cost of Damages Other Than Car	Total	Type of Accident[1] Vehicular	Pedestrian	Other
Total	100.00%	100.00%	--	100.00%
Under $50.00	13.53	10.75	--	32.26
$ 50.00 - $ 99.99	14.31	14.52	--	12.90
$ 100.00 - $ 199.99	23.56	24.19	--	19.35
$ 200.00 - $ 299.99	11.97	11.83	--	12.90
$ 300.00 - $ 499.99	17.68	19.35	--	6.45
$ 500.00 - $ 749.99	9.32	10.22	--	3.23
$ 750.00 - $1,499.99	6.40	5.91	--	9.68
$1,500.00 and over	3.23	3.23	--	3.23

[1]Sample numbers were: Total, 217; Vehicular, 186; Pedestrian, 0; Other, 31.

TABLE 24

Universe Numbers and Percentage Distribution of Sources Used to Cover Property Damage Losses, Classified by Type of Accident as Reported by the Respondents to the Survey of Victims of 1955 New Jersey Automobile Accidents

Sources of Funds	Total[1]	Type of Accident Vehicular	Pedestrian	Other
Total[2]	100.00%	100.00%	100.00%	100.00%
Own collision insurance	39.54	37.75	37.93	60.77
Other party's insurer	36.14	37.95	24.14	16.15
Other party himself	4.09	4.21	---	3.08
Both other party and his insurer	.87	.89	--	.77
Did not collect	19.36	19.20	37.93	19.23

[1]Number of vehicles damaged in fatal and nonfatal bodily injury accidents and in property damage only accidents. It is assumed that "property damage other than to car" accidents also involved property damage to the car.
[2]Sample numbers were: Total, 1,727; Vehicular, 1,568; Pedestrian, 29; Other, 130.

TABLE 25

Percentage Distribution of Nonfatal and Property Damage Victims With Claims Against the Other Party or His Insurer, Classified by Responses to Questions Concerning Counsel, Settlement Mode, and Whether or Not Judgment was Rendered as Reported by Respondents to the Survey of Victims of 1955 New Jersey Automobile Accidents (Detailed Questionnaire)

Claims	Combined Total (Weighted)[1]	Property Damage Victims	Bodily Injury Victims[2]
Response to Counsel[3]	100.00%	100.00%	100.00%
No Claim Made	6.54	7.89	4.76
No Lawyer Hired	58.50	69.08	44.53
Lawyer Hired	34.96	23.03	50.71
Before Offer of Settlement	20.24	11.40	31.90
After Offer of Settlement	5.18	3.51	7.38
Timing Not Stated	9.54	8.12	11.43
Response to Settlement Mode[4]	100.00	100.00	100.00
Settled Without Suit	77.92	86.01	67.24
Settled With Suit	22.08	13.99	32.76
Settled Without Trial	11.55	8.45	15.65
Settled With Trial	10.53	5.54	17.11
Response to Judgment[5]	100.00	100.00	100.00
Judgment Against Victim	30.43	42.11	15.00
Judgment For Victim	69.57	57.89	85.00

[1]A weight of 1.32 was assigned to Property Damage Only. This ratio was computed by comparing the total number of property damage only victims to the number of nonfatal bodily injury victims in the estimated universe (Table 2).
[2]May have suffered property damage also.
[3]Sample numbers were: Total, 876; Property Damage, 456; Bodily Injury, 420.
[4]Sample numbers were: Total, 752; Property Damage, 343; Bodily Injury, 409.
[5]Sample numbers were: Total, 79; Property Damage, 19; Bodily Injury, 60.

TABLE 26

Percentage Distribution of Those Accepting or Rejecting the First Offer of Settlement and the Reasons for Rejecting, Classified by Type of Accident as Reported by Respondents to the Survey of Victims of 1955 New Jersey Automobile Accidents (Detailed Questionnaire)

First Offer	Combined Total	Type of Accident Vehicular	Pedestrian	Other
Total[1]	100.00%	100.00%	100.00%	100.00%
Accepted	72.51	72.48	76.67	69.44
Rejected	27.42	27.52	23.33	30.56
Reasons for Rejecting First Offer				
Total Rejected[2]	100.00%	100.00%	100.00%	100.00%
Too small	71.71	71.64	85.71	63.64
Thought could get more	7.24	7.46	--	9.09
Decided to hire lawyer	3.95	2.99	--	18.18
Too early to know loss	7.89	8.21	14.29	--
Took care of own losses	1.97	2.24	--	--
Do not know, etc.	7.24	7.46	--	9.09

[1]Sample numbers were: Total, 553; Vehicular, 487; Pedestrian, 30; Other, 36.
[2]Sample numbers were: Total, 109; Vehicular, 96; Pedestrian, 6; Other, 7.

tion of the settlement was available and/or where individuals indicated a distribution of the proceeds, the data were tabulated. (See Table 28.)

Total. The most striking conclusion evident from the data shown in Table 28 is the concentration of settlements at the lowest levels. It is evident that 66.13 percent of all settlements were made for amounts of less than $299.99; only 5.41 percent were for amounts in excess of $1,500.

Property Damage. In the data for property damage settlements a slightly different pattern is evident. Altogether 79.55 percent of all settlements were for less than $399.99; only 1.62 percent were for more than $1,500. The modal settlement category was $100.00-$199.99, with 27.92 percent reporting this. The median of this distribution is $193, and the arithmetic mean is $306, if the midvalue of the interval of $1,500 and over is assumed to be $2,500.

Approximately 30 percent of all property damage settlements were to property-damage only victims. Since 61.72 percent of all settlements were for property damage, more than half of all settlements for property damage were to persons who suffered bodily injury also.

Bodily Injury and Medical Payments. Bodily injury settlements under liability show a somewhat different distribution, the modal claim being in the $1,500-and-over category (17.53 percent). On the other hand, 48.45 percent reported settlements of $299.99 or less. In the case of medical payments, the settlements are heavily concentrated at the low end of the scale, 35.11 percent being for less than $50 and 15.96 percent for $50.00-$99.99. Clearly, small claims for medical aid are met by medical payments while the larger claims apparently are met by liability insurance.

The median of the bodily injury settlements was $321, and the arithmetic mean, $1,177 if the midvalue of the interval of $1,500 and over is assumed to be $5,000. More than half of these claims, 55.67 percent, were for under $400. More than half, 51.07 percent, of settlements for medical expenses were under $100. The median for medical payments was $93 and the arithmetic mean, $442. One should note that the mean bodily injury settlement was higher than the mean loss for bodily injury, as indicated by respondents. This difference was to be expected, because many of those having claims against the other party or his insurer included large items for pain and suffering and punitive damages, some of which are paid. No actual monetary cost for these items can be shown in most cases.[25]

New Jersey Financial Responsibility Requirements and the Unsatisfied Judgement Fund

In answer to a question concerning them, more than half, 59.12 percent, of the respondents stated that they were aware of both the New Jersey financial responsibility requirements and the Unsatisfied Judgment Fund. Some 18.85 percent knew only of the financial responsibility requirements, while 1.64 percent reported that they had knowledge only of the Unsatisfied Judgment Fund. Some 20.39 percent reportedly knew of neither of these provisions. There were no significant differences in the degree of knowledge reported among persons involved in the three types of accidents. (See Table 29.)

Interest in Compensation Coverage

Because of the purpose of this study—preparation of comparative costs of insurance against auto accidents under a voluntary scheme with financial responsibility requirements, under a compulsory liability system and under a compensation form—the respondents were asked to express their opinions on the compensation principle as applied to auto-

[25]For a considerable description of this problem in a similar study, see Temple University Bureau of Economic and Business Research, op. cit., pp. 76-77.

TABLE 27

Percentage Distribution of Size of First Offer to Settle Claim Compared With Size of Final Settlement, Classified by Type of Accident as Reported by Respondents to the Survey of Victims of 1955 New Jersey Automobile Accidents (Detailed Questionnaire)

Size Groups	Type of Accident			
First Offer	Total	Vehicular	Pedestrian	Other
Total[1]	100.00%	100.00%	100.00%	100.00%
Under $100.00	26.30	26.11	23.08	30.00
$ 100.00 - $ 199.99	23.57	25.28	--	13.33
$ 200.00 - $ 299.99	12.16	12.50	--	13.33
$ 300.00 - $ 499.99	12.65	13.05	15.38	6.67
$ 500.00 - $ 749.99	8.44	8.61	7.70	6.67
$ 750.00 - $ 999.99	3.97	3.89	7.70	3.33
$1,000.00 - $1,499.99	4.96	3.61	15.38	16.67
$1,500.00 - $1,999.99	1.49	1.11	15.38	--
$2,000.00 - $2,999.99	1.74	1.67	7.69	--
$3,000.00 - $4,999.99	2.98	2.50	7.69	6.67
$5,000.00 and over	1.74	1.67	--	3.33
Final Settlement				
Total[2]	100.00%	100.00%	100.00%	100.00%
Under $100.00	21.50	21.33	25.00	21.22
$ 100.00 - $ 199.99	20.35	21.33	10.00	15.15
$ 200.00 - $ 299.99	13.08	13.87	5.00	9.09
$ 300.00 - $ 499.99	12.38	13.34	5.00	6.06
$ 500.00 - $ 749.99	8.64	8.53	--	15.15
$ 750.00 - $ 999.99	4.91	4.53	10.00	6.06
$1,000.00 - $1,499.99	7.01	7.47	--	6.06
$1,500.00 - $1,999.99	2.80	2.40	5.00	6.06
$2,000.00 - $2,999.99	2.34	1.87	10.00	3.03
$3,000.00 - $4,999.99	3.04	1.60	20.00	9.09
$5,000.00 and over	3.97	3.73	10.00	3.03

[1]Numbers in the samples were: Total, 403; Vehicular, 360; Pedestrian, 13; Other, 30.
[2]Numbers in the samples were: Total, 428; Vehicular, 375; Pedestrian, 20; Other, 33.

TABLE 28

Percentage Distribution of Settlement, Classified by Size of Settlement and by Division of Settlement Among Property Damage, Bodily Injury, and Medical Payments, as Reported by Respondents to the Survey of Victims of 1955 New Jersey Automobile Accidents

Size of Settlement			Bodily Injury	
Percentage by category	Total	Property Damage	Liability	Medical Payments
Total[1]	100.00%	100.00%	100.00%	100.00%
Under $50.00	14.63	8.77	13.40	35.11
$ 50.00 - $ 99.99	13.83	15.26	7.22	15.96
$ 100.00 - $ 199.99	22.84	27.92	14.43	14.89
$ 200.00 - $ 299.99	14.83	15.91	13.40	12.77
$ 300.00 - $ 399.99	9.22	11.69	7.22	3.19
$ 400.00 - $ 499.99	5.41	6.49	4.12	3.19
$ 500.00 - $ 749.99	8.42	7.79	12.37	6.38[3]
$ 750.00 - $1,499.99	5.41	4.55	10.31	3.19[3]
$1,500.00 and over	5.41	1.62	17.53	5.32[3]

TABLE 28 (Continued)

Percentage Distribution of Settlement, Classified by Size of Settlement and by Division of Settlement Among Property Damage, Bodily Injury, and Medical Payments, as Reported by Respondents to the Survey of Victims of 1955 New Jersey Automobile Accidents

Size of Settlement			Bodily Injury	
Percentage within category	Total	Property Damage	Liability	Medical Payments
Total	100.00%	61.72%	19.44%	18.84%
Under $50.00	100.00[2]	36.99	17.81	45.20
$ 50.00 - $ 99.99	100.00	68.12	10.14	21.74
$ 100.00 - $ 199.99	100.00	75.44	12.26	12.28
$ 200.00 - $ 299.99	100.00	66.22	17.57	16.21
$ 300.00 - $ 399.99	100.00	78.26	15.22	6.52
$ 400.00 - $ 499.99	100.00	74.07	14.82	11.11
$ 500.00 - $ 749.99	100.00	57.14	28.57	14.29
$ 750.00 - $1,499.99	100.00	51.85	37.04	11.11[3]
$1,500.00 and over	100.00	18.52	62.96	18.52[3]

[1]Numbers in the samples were: Total, 499; Property damage, 308; Bodily injury liability, 97; Medical payments, 94.
[2]Numbers in the samples within each interval were--from low to high values: 73, 69, 114, 74, 46, 27, 42, 27, 27, and, total 499.
[3]Probably these data were misclassified by the respondent. In most cases, settlements in excess of $750-$1,000 would be under the liability rather then the medical payments coverage.

TABLE 29

Percentage Distribution of Knowledge of New Jersey Financial Responsibility Requirements and of the Unsatisfactory Judgment Fund as Reported by Respondents to the Survey of Victims of 1955 New Jersey Automobile Accidents (Detailed Questionnaire)

Type of Accident	Total	Aware Of			Unaware of Both
		Both	Financial Responsibility Only	Judgment Fund Only	
Combined Total[1]	100.00%	59.12%	18.85%	1.64%	20.39%
Vehicular	100.00	60.02	19.11	1.55	19.32
Pedestrian	100.00	51.51	19.70	3.03	25.76
Other	100.00	56.25	16.41	1.56	25.78

[1]Sample numbers were: Total, 1,162; Vehicular, 968; Pedestrian, 66; Other, 128.

TABLE 30

Percentage Distribution of Respondents Indicating Interest in Direct Insurance Compensation Coverage, Classified by Type of Accident as Reported by Respondents to the Survey of Victims of 1955 New Jersey Automobile Accidents (Detailed Questionnaire)

Type of Accident	Total	Yes	No	No Opinion or Doubtful
Combined Total[1]	100.00%	53.73%	43.82%	2.45%
Vehicular	100.00	52.94	44.24	2.82
Pedestrian	100.00	50.91	47.27	1.82
Other	100.00	60.87	39.13	--

[1]Sample sizes are: Total, 1,020; Vehicular, 850; Pedestrian, 55; Other, 115.

mobile accidents. A significantly larger percentage, 53.73 percent, expressed an interest in a direct compensation coverage which would pay limited benefits for all injuries received and wages lost as a result of accidents regardless of who was at fault, providing there were no loss of the right to proceed through the courts. Only 2.45 percent were in doubt or did not wish to express an opinion, while 43.82 percent were opposed to this principle. (See Table 30.)

The respondents were then asked to indicate their reasons for the response given. "Better coverage" was the most frequent answer (18.35 percent) given by respondents favoring adoption of the compensation principle. Other reasons for favoring the change were: "makes settlement more certain" (7.86 percent), "avoids litigation" (2.23 percent), and "shortens settlement time" (5.51 percent). (See Table 31.)

Among those responding negatively to the question, "Present insurance is adequate" was the most frequent reason given (18.74 percent). Other reasons were: "would reduce effectiveness of safety campaigns" (4.98 percent), "might prejudice juries" (0.79 percent), and "payment for damages is the obligation of the family" (7.73 percent).

ACCIDENT COSTS—1955

Since the purpose of this study is to compute costs of automobile accidents under various hypotheses concerning insurance coverages, this section concludes with a summary of costs based on victims' responses. In effect, this segment indicates what the costs of damage to persons and property were, assuming that the victim sample experience was representative.

Against these losses certain recoveries were obtained. If the recoveries are compared with costs, there will remain the out-of-pocket losses. In addition, net insurance costs must be added to the losses sustained in order to obtain the gross cost of automobile accidents.

As a first step, costs by type of loss are summarized together with the methodology used in preparing the estimates. Subsequently, certain additions and refinements are presented.

Bodily Injury Costs

Using the information gathered from victims in the survey, it is estimated that the total costs of bodily injuries averaged $23.58 per registered vehicle. Included in this average are costs of $18.11 resulting from nonfatal injuries in both fatal and nonfatal accidents and $5.47 from fatal injuries.

Nonfatal Injuries. The average cost of $17.99 per vehicle registered[26] resulting from nonfatal injuries was computed from losses indicated by victims in the Survey of 1955 New Jersey Automobile Accidents as shown by Tables 15, 16, 17, and 18. This average may be divided as shown in Table 32.

TABLE 32

Costs of Nonfatal Bodily Injuries, as Reported by Victims of 1955 New Jersey Automobile Accidents

Type of Cost	Average Cost
Own physician and hospital bills	$ 5.80
Wages	4.40
Other	4.45
Total losses from own injuries	$14.65
Dependents' injuries	3.34
Total losses from nonfatal injuries	$17.99

To obtain the average costs, arithmetic means were computed for each type of accident (i.e. vehicular, pedestrian, and other)[27] using the responses of victims involved in nonfatal accidents. These averages were multiplied by the universe values for the type of accident and the cost category under consideration. The products obtained for the three types of

[26] 2,001,076 vehicles, registration period ended March 31, 1955. Source: Department of Public Law and Safety, **Forty-Ninth Annual Report of the Director, Division of Motor Vehicles of the State of New Jersey** for the year 1954, Frederick J. Gassert, Jr., Director, Trenton, New Jersey.

[27] The separate averages were used rather than an average computed directly from the combined total because the sample had a smaller proportion of "other" accidents than did the universe. A combined average would, therefore, have understated the effect of costs of "other" accidents.

TABLE 31

Percentage Distribution of Reasons for Reply to Interest or Lack of Interest in Direct Insurance Compensation Coverage as Reported by Respondents to the Survey of 1955 New Jersey Automobile Accidents (Detailed Questionnaire)

Reasons	Combined Total	Type of Accident: Vehicular	Pedestrian	Other
Total[1]	100.00%	100.00%	100.00%	100.00%
For				
Makes settlement certain	7.86	7.54	13.16	8.00
Avoids litigation	2.23	2.31	2.63	1.33
Shortens settlement time	5.51	5.38	5.26	6.67
Better coverage	18.35	18.46	13.16	20.00
Against				
Reduces safety campaign effectiveness	4.98	4.77	7.90	5.33
Family obligations and/or assistance	7.73	7.84	--	10.67
Present insurance adequate	18.74	19.03	15.79	17.33
Prejudice jury	.79	.77	2.63	--
Which company will pay?	1.31	1.54	--	--
Miscellaneous				
Wants more information	7.47	7.54	2.63	9.33
Other	25.03	24.77	36.84	21.34

[1]Sample numbers were: Total, 763; Vehicular, 650; Pedestrian, 38; Other, 75.

TABLE 33

Computation of Average Costs of Nonfatally Injured Respondents for Own Physician and Hospital Bills, as Indicated by Respondents to the Survey of Victims of 1955 New Jersey Automobile Accidents

I. Average Cost, Type of Accident

Size of Loss	Mid Value of Loss Interval	Vehicular: Number[1]	Vehicular: Mid Value X Number	Pedestrian: Number	Pedestrian: Mid Value X Number	Other: Number	Other: Mid Value X Number
Under $50.00	$ 25	91	$2,275	6	$150	31	$775
$50.00 - $99.99	75	31	2,325	3	225	3	225
$100.00 - $199.99	150	35	5,250	5	750	9	1,350
$200.00 - $299.99	250	4	1,000	1	250	3	750
$300.00 - $499.99	400	6	2,400	--	--	4	1,600
$500.00 - $749.99	625	4	2,500	2	1,250	3	1,875
$750.00 - $999.99	875	3	2,625	2	1,750	--	--
$1,000.00 - $1,499.99	1,250	1	1,250	2	2,500	2	2,500
$1,500.00 - $1,999.99	1,750	4	7,000	--	--	--	--
$2,000.00 - $2,999.99	2,500	1	2,500	--	--	1	2,500
$3,000.00 - and over	5,000	5	25,000	2	10,000	1	5,000
	--	185	$54,125	23	$16,875	57	$16,575

Arithmetic Mean = $\bar{X} = \frac{54,125}{185} = \$292.57$

Median = $Md = \left[\frac{\frac{185}{2} - 91}{31}\right] 50 + \$50 = \$52.42$

$\bar{X} = \frac{16,875}{23} = \$733.70$

$Md = \left[\frac{\frac{23}{2} - 9}{5}\right] \$100 + 100 = \$150.00$

$\bar{X} = \frac{16,575}{57} = \$290.79$

$Md = \left[\frac{\frac{57}{2} - 0}{31}\right] 50 + 0 = \$45.97$

Arithmetic Mean Assuming a Maximum Cost of $3,000 = $\bar{X}' = \frac{44,125}{185} = \$238.57$

$\bar{X}' = \frac{12,875}{23} = \$559.78$

$\bar{X}' = 14,575 = \$255.70$

II. Average Cost in Nonfatal Accidents per Registered Vehicle

Accident Type	Average Cost ($\bar{X}$)	Number in Universe (N)m	Total Costs ($\bar{X}$N)
Combined Total	$311.19[3]	37,027	$11,522,317.53
Vehicular	292.57[2]	25,671	7,510,564.47
Pedestrian	733.70[2]	1,602	1,175,387.40
Other	290.79[2]	9,754	2,836,365.66

III. Average Cost, Nonfatally Injured, Fatal Accidents

Average Cost ($\bar{X}$)	Number in Universe (N)m	Total Costs ($\bar{X}$N)
$303.42[3]	263	$79,798.86
292.57	124	36,278.68
733.70	7	5,135.90
290.79	132	38,384.28

TABLE 33 (Continued)

IV. Cost per Vehicle Registered

Nonfatal accidents $\frac{11,522,317.53}{2,001,076} = \$5.76$

Fatal accidents $\frac{79,798.86}{2,001,076} = .04$

$5.80 Total

[1]See Table 15.
[2]From I, above.
[3]Combined Total Costs divided by Combined Total Universe.
[4]The average cost computed for nonfatal accidents has been used.

TABLE 34

Comparisons of Means and Medians For Nonfatal Bodily Injury Losses as Reported by Respondents to the Survey of Victims of 1955 New Jersey Automobile Accidents

Types of Accident	Arithmetic Mean: Using $5,000 as Upper Midvalue	Using $3,000 as Upper Maximum	Median
Nonfatal Bodily Injuries			
Own Physician and Hospital Bills	$311.19	$ --	$ --
Vehicular	292.57	238.57	52.42
Pedestrian	733.70	559.78	150.00
Other	290.79	255.70	45.97
Wage Losses	443.86	--	--
Vehicular	284.94	250.85	46.43
Pedestrian	822.22	822.22	450.00
Other	905.43	731.52	375.00
Other Losses	344.97	--	--
Vehicular	257.93	257.93	95.00
Pedestrian	875.00	675.00	250.00
Other	668.77	514.42	266.67
Losses from Dependent's Injuries	654.99[1]	--	--
Vehicular	504.77	450.23	190.00
Pedestrian	900.00	900.00	150.00
Other	884.21	673.68	170.00

[1]Loss per respondent with injured dependents. There were approximately 1.16 injured dependents for each respondent. The averages per dependent were all types of accidents, $566.72; Vehicular, $436.50; Pedestrian, $778.05; Other, $764.53.

accidents within each kind of cost were then added, and the total obtained was divided by the number of vehicles registered to arrive at the arithmetic mean of costs of injuries in nonfatal accidents.[28]

The averages calculated from nonfatal injuries in nonfatal accidents were then applied against the estimated number injured nonfatally in accidents involving fatalities. These costs may be underestimated since fatal accidents may have resulted in more serious injuries even to those not killed. However, the number of such cases is so small relative to the number of vehicles registered that increasing the costs to twice the amounts used would increase the average total costs by only 11 cents (from $17.99 to $18.10).

An illustration of the method used in the calculation of the $5.80 average for costs of "own physician and hospital bills" is shown in Table 33. Results of all bodily injury computations are summarized thereafter in Tables 34 and 35.

All cost distributions are skewed (asymmetrical) with the great majority of costs to individuals being below the arithmetic mean. In "own physicians and hospital bills" for vehicular accidents, for example, approximately 84 percent of the individuals paid less than the mean of $292.57. The median, therefore, is a better measure for describing the central tendency of costs, but the arithmetic mean must be used to obtain total costs of accidents. Table 34 shows the median costs for the various loss categories.

In the computations of the means from victims' responses, $5,000 was used as the midvalue of the open-end interval of losses $3,000 and over, because the cases for which responses were obtained averaged approximately $5,000. However, if a value of $3,000 were to be placed on such losses, a lower mean would result. The means based on both values are shown in Table 34.

Information contained in Table 18 was used to compute costs for dependents' injuries per respondent with injured dependents. The averages found from the sample of persons with injured dependents were multiplied by the number of persons with injured dependents in the universe. Total costs were then divided by the number of dependents injured to obtain the cost per dependent. There were approximately 1.16 injured dependents per primary respondent with dependents.

Nonfatal Bodily Injury Losses—Sources of Funds

Costs for nonfatal bodily injuries were paid by respondents from a number of different sources as shown by Table 19. The distribution of losses by sources of funds used was as follows:

Source of Funds Used	Percentage of Total Loss Paid	Amount per Registered Vehicle
Victim's Insurer	37.07%	$ 6.67
Other Party's Insurer	32.42	5.83
Other Party Personally	2.88	0.52
Respondent Personally	24.42	4.39
Temporary Disability, Unemployment Insurance, and Workmen's Compensation	3.21	0.58
Total	100.00	$17.99

Sample numbers, as shown in Table 19, were used to compute the percentage distribution of losses among sources. The number of individuals in the proportions "less than one-half" and "more than one-half" were weighted according to an estimated proportion for the particular type of source by group on the basis of responses, and the resulting weighted number was expressed as a percentage of the total weighted values. (See Table 36.) The percentages were then mutiplied by the total costs of $17.99 to find the amount per registered vehicle.

Fatal Injuries

Losses from fatal injuries have been computed on a different basis and with different assumptions than costs of non-

[28]Commercial vehicles, busses, etc. all are included in "other" figures. In a true insurance system, some measure of exposure should be used to weight the distribution.

TABLE 35

Summary of Nonfatal and Fatal Injury Losses From 1955 New Jersey Automobile Accidents Based on Victim Survey Results and the Adjusted New Jersey Universe[1]

Types of Accident[2]	Arithmetic Mean Per Vehicle Registered	Number of Persons in Universe	Costs[3]
Bodily Injuries - Total	$23.46	49,881	$46,957,966
Nonfatal Injuries - Total	17.99	49,090	36,001,166
Own Physician and Hospital Costs	5.80	37,290	11,602,117
Nonfatal Accidents	5.76	37,027	11,522,318
Fatal Accidents	.04	263	79,799
Loss of Wages	4.40	19,794	8,803,432
Nonfatal Accidents	4.36	19,661	8,726,694
Fatal Accidents	.04	133	76,738
Other Losses	4.45	25,789	8,908,306
Nonfatal Accidents	4.42	25,629	8,841,357
Fatal Accidents	.03	160	66,949
Losses from Dependents' Injuries	3.34	11,800	6,687,311
Nonfatal Accidents	3.32	11,721[4]	6,638,299
Fatal Accidents	.02	79	49,012
Fatal Injuries - Total	5.47	791	10,956,800
Primaries	5.38	673	10,768,000
Dependents	.09	118	188,800
Vehicular	Per Person		
Bodily Injuries - Total	$734.72[5]	33,296	$24,463,149
Nonfatal Injuries - Total	611.80[5]	32,987	20,181,549
Own Physician and Hospital Costs	292.57	25,795	7,546,843
Nonfatal Accidents	292.57	25,671	7,510,564
Fatal Accidents	292.57	124	36,279
Loss of Wages	284.94	14,600	4,160,124
Nonfatal Accidents	284.94	14,530	4,140,178
Fatal Accidents	284.94	70	19,946
Other Losses	257.93	20,685	5,335,282
Nonfatal Accidents	257.93	20,586	5,309,747
Fatal Accidents	257.93	99	25,535
Losses from Dependents' Injuries	436.50	7,192	3,139,300
Nonfatal Accidents	436.50	7,157[4]	3,124,022
Fatal Accidents	436.50	35	15,278
Fatal Injuries - Total	13,856.31[5]	309	4,281,600
Primaries	16,000.00	263	4,208,000
Dependents	1,600.00	46	73,600
Pedestrian			
Bodily Injuries - Total	1,933.61[5]	3,696	$7,142,607
Nonfatal Injuries - Total	1,122.97[5]	3,461	3,886,607
Own Physician and Hospital Costs	733.70	1,609	1,180,523
Nonfatal Accidents	733.70	1,602	1,175,387
Fatal Accidents	733.70	7	5,136
Loss of Wages	822.22	715	587,888
Nonfatal Accidents	822.22	712	585,421
Fatal Accidents	822.22	3	2,467
Pedestrian			
Other Losses	$875.00	774	$677,250
Nonfatal Accidents	875.00	771	674,625
Fatal Accidents	875.00	3	2,625
Losses from Dependents' Injuries	778.05	1,852	1,440,946
Nonfatal Accidents	778.05[4]	1,845[4]	1,435,500
Fatal Accidents	778.05	7	5,446
Fatal Injuries - Total	13,855.32[5]	235	3,256,000
Primaries	16,000.00	200	3,200,000
Dependents	1,600.00	35	56,000
Other			
Bodily Injuries - Total	$1,191.11[5]	12,889	$15,352,211
Nonfatal Injuries - Total	943.92[5]	12,642	11,933,011
Own Physician and Hospital Costs	290.79	9,886	2,874,750
Nonfatal Accidents	290.79	9,754	2,836,366
Fatal Accidents	290.79	132	38,384
Loss of Wages	905.43	4,479	4,055,421
Nonfatal Accidents	905.43	4,419	4,001,095
Fatal Accidents	905.43	60	54,326
Other Losses	668.77	4,330	2,895,774
Nonfatal Accidents	668.77	4,272	2,856,985
Fatal Accidents	668.77	58	38,789
Losses from Dependents' Injuries	764.53	2,756	2,107,066
Nonfatal Accidents	764.53[5]	2,719[4]	2,078,778
Fatal Accidents	764.53	37	28,288
Fatal Injuries - Total	13,842.91[5]	247	3,419,200
Primaries	16,000.00	210	3,360,000
Dependents	1,600.00	37	59,200

[1] See Table 5 and the text for a description of the adjusted universe and a summary of victim responses.

[2] The numbers in the universe of primary individuals reporting dependent injuries were: Total, 10,135; Vehicular, 6,189; Pedestrian, 1,595; and Other, 2,351.

[3] May not add because of rounding.

[4] Number shown is number of dependents injured.

[5] Computed by dividing costs by the number in the universe.

fatal injuries. Nonfatal injury losses represent actual costs as reported by victims of 1955 New Jersey automobile accidents. However, as was mentioned earlier, surviving victims of fatal accidents frequently were not willing to answer questions completely (or not at all) pertaining to the accident and to its consequences. Costs, therefore, were based on payments made by four insurance companies for death claims filed during the second quarter of the calendar year 1955. These payments represent not actual costs but a combination of costs, losses of future services, and compromise values. The insurance company sample indicated an average payment of $16,000 per primary individual, with one-third of the claims receiving no payments; and $1,600 per dependent, with all claims being compensated. The average payment for deaths of primary individuals would have been $24,000 if claims unpaid had been omitted from the computations. The application of the average of $16,000, therefore, assumes that one-third of all primary fatalities would not be compensated.

The average cost of fatalities per vehicle registered were calculated in the same manner as nonfatal bodily injury costs, i.e., the averages were multiplied by the number of deaths in the universe for each type of accident, and the total of the products was divided by the number of vehicles registered.

Property Damage Costs

The average cost of property damage per vehicle registered was $41.15, of which $31.34 was for damage to car and $9.81 for damage to property other than car. If it were to be assumed that each person would bear the first $50 of loss to his own vehicle as a maintenance expense, the average cost per registered vehicle would have been $36.73. These costs may be divided as follows:

Property Damage to:	Average Cost per vehicle registered	
	Total (no deductions)	If $50 deductible is assumed
Car:		
Nonfatal and Property damage only	$31.16	$26.77
Fatal accidents	.18	.15
Total to car	$31.34	$26.92
Other than Car:		
Nonfatal and property damage only	$ 9.76	$ 9.76
Fatal accidents	.05	.05
Total to other than car	$ 9.81	$ 9.81
All Property Damage	$41.15	$36.73

Sample numbers, costs according to respondents, and universe values as shown in Table 21 were used to compute average costs of damages to car. These were used rather than costs of "repairs to car" because some damages, while not repaired when owners would have had to bear the losses, would likely have been made if the cars had been insured. The method of determining average costs of damage is illustrated in Table 37. As in computing bodily injury costs, arithmetic means were calculated for losses in each type of accident as indicated by respondents having such costs. These averages were multiplied by the corresponding universe numbers for each type of accident and then added for the three types of accidents to obtain the total costs. This total was divided by the number of vehicles registered to find the average cost per vehicle registered.

The averages were applied to the total number of cars involved in fatal accidents. Two assumptions were made, one of which might tend to understate and the other to overstate costs. The use of average costs obtained in nonfatal and property damage only accidents may tend to understate, because fatal accidents may have resulted in greater damage. All cars involved in fatal accidents were assumed to have been damaged, whereas in nonfatal accidents some cars escaped damage. If either of the assumptions is incorrect, however, the change in average costs per vehicle registered would be only one or two cents, because the num-

TABLE 36
Method of Computing Distribution of Payments by Source

Source of Funds	Number in Sample	Approximate Proportion of Funds Received		Weights	Percent of Total
1. Respondent's Own Insurance					
Less than half	48	.4	=	19.20	
More than half	193	.9	=	173.70	37.07
2. Other Party's Insurance					
Less than half	33	.25	=	8.25	
More than half	214	.75	=	160.50	32.42
3. Other Party Personally					
Less than half	12	.25	=	3.00	
More than half	16	.75	=	12.00	2.88
4. Respondent Personally					
Less than half	35	.4	=	14.00	
More than half	118	.9	=	106.20	
5. Other--Borrowed, Family, etc.					
Less than half	5	.4	=	2.00	
More than half	7	.7	=	4.90	24.42
6. Temporary Disability or Unemployment Insurance, Workmen's Compensation					
Less than half	19	.4		7.60	
More than half	13	.7		9.10	3.21
	713			520.45	100.00

TABLE 37
Computations of Average Losses From Damages to Vehicles as Reported by Respondents to the Survey of Victims of 1955 New Jersey Automobile Accidents

Losses	Vehicular: Mid-value of Loss Interval	Vehicular: Number of Responses	Vehicular: Mid-value Times Number	Pedestrian: Number	Pedestrian: Mid-value Times Number	Other: Number	Other: Mid-value Times Number
Under $50	$ 25	69	1,725	2	50	2	50
$ 50 - $ 99.99	75	96	7,200	1	75	3	225
$ 100 - $ 199.99	150	169	25,350	-	--	5	750
$ 200 - $ 299.99	250	111	27,750	-	--	9	2,250
$ 300 - $ 499.99	400	161	64,400	-	--	15	6,000
$ 500 - $ 749.99	625	68	42,500	-	--	8	5,000
$ 750 - $1,499.99	1,125	38	42,750	-	--	10	11,250
$1,500 and over	2,500	9	22,500	-	--	5	12,500
Total		721	234,175	3	125	57	38,025
Total Loss, Not Repaired	500	40	20,000	-	--	16	8,000
Total		761	254,175	3	125	73	46,025

Arithmetic Mean = $\bar{x} = \frac{254,175}{761} = \$334.00$ $\quad \bar{x} = \frac{125}{3} = \$41.67$ $\quad \bar{x} = \frac{46,025}{73} = \$630.48$

Median = $Md = \left[\frac{\frac{761}{2} - 334}{111}\right] 100 + 200 = \$242.34$ $\quad Md = \$50.00$ $\quad \left[Md = \frac{\frac{73}{2} - 34}{8} 250 + 500 = \$578.13\right]$

TABLE 37 (Continued)

Type of Accident	Arithmetic Mean ($\bar{x}$)	Number of Damaged Vehicles in Nonfatal Universe (N)	$\bar{x}N$	$(\bar{x}-50)N$
Combined Total	$354.76	175,753	62,349,765.94	53,572,448.48
Vehicular	334.00	160,989	53,770,326.00	45,720,876.00
Pedestrian	41.67	1,238	51,587.46	--
Other	630.48	13,526	8,527,872.48	7,851,572.48
Average per Vehicle Registered			31.16	26.77

[1] Total costs of the three types of accidents divided by the total number of vehicles.

TABLE 38
Summary of Property Damage Costs as Reported by Respondents to the Survey of Victims of 1955 New Jersey Automobile Accidents

Type of Accident	To Car: Nonfatal and Property Damage Only	To Car: Fatal Accidents	To Other Than Car: Nonfatal and Property Damage Only	To Other Than Car: Fatal Accidents
Numbers				
Combined Universe Total	175,753	1,054	53,987	268
Vehicular	160,989	564	47,703	161
Pedestrian	1,238	234	--	--
Other	13,526	256	6,284	107
Dollars				
Combined Universe Cost	$62,349,786	$359,530	$19,525,423	$92,882
Vehicular	53,770,236	188,376	17,548,960	59,229
Pedestrian	51,587	9,751	--	--
Other	8,527,872	161,403	1,976,444	33,654
Arithmetic Mean				
Combined	$354.76	$341.11	$361.67	$346.57
Vehicular	334.00	334.00	367.88	367.88
Pedestrian	41.67	41.67	--	--
Other	630.48	630.48	314.52	314.52
Median				
Combined	--	--	--	--
Vehicular	$274.79	--	$204.55	--
Pedestrian	50.00	--	--	--
Other	578.13	--	125.00	--
Combined Total, Average per Vehicle Registered	$ 31.16	$ .18	$ 9.76	$ .05

ber of cars involved in fatal accidents was only 1,054 compared with the 2,001,076 vehicles registered.

Costs of damages to cars involved in bodily injury accidents and to cars involved in property-damage only accidents could not be separated. If cars involved in bodily injury accidents had greater damage than those involved in property-damage only accidents, the combining of the two types may have resulted in an overstatement of losses. This would result because the proportion of respondents involved in bodily injury accidents in the sample is greater than in the universe.

Property damage to other than the car was calculated from information shown in Table 23. The same method of computation was used as that described above for damages to car. Numbers of vehicles in the universe were obtained by using proportions of numbers of respondents indicating property damage to numbers of owners or drivers answering the question, "Were there other property losses in the accident?" In vehicular accidents, 28.5 percent said "Yes," and in "other," 41.9 percent answered in the affirmative.[29] These proportions were applied to the total number of vehicles[30] involved in accidents as shown in the universe (Table 6), excluding those in fatal accidents. These same proportions multiplied by the number of vehicles involved in fatal accidents were used to obtain the universe values of vehicles with property damage other than to car. The average costs of damages for nonfatal and property-damage only vehicles were applied to the universe of fatal vehicles.

All property damage costs and the results of the various computations are shown in Table 38. The distributions of costs are asymmetrical (although not as much skewed as the losses from bodily injuries), and, therefore, the median is the better measure to use in representing central tendency of the data. The arithmetic mean must be used, however, in computing costs.

Sources of Funds Used to Cover Property Damage Losses

Proportions shown in the sample responses to questions on sources of funds used to cover property damage losses were used to find amounts of the average to be distributed to the various sources. These proportions are slightly different from those shown on Table 24 for two reasons: (1) Four respondents answered the funds question but did not indicate the type of accident and therefore are not shown on the table, but were used in the distribution. (2) The "collected from both the other party and from the other party's insurer" category was spread to the aggregate classifications. Proportions actually used are shown in Table 39. The percentages indicated above were then applied to universe costs as shown in Table 40.

ACCIDENT COSTS, PRESENT SYSTEM

Summarizing the materials shown earlier, New Jersey automobile accidents in 1955 resulted in total costs of damages, including fatalities, as follows:

Nonfatal bodily injuries	$ 36,001,166
Fatal bodily injuries	10,956,800
Property damage to car	62,709,316
Property damage to other than car	19,678,305
Total	$129,345,587

Dividing this total by the 2,001,076 registered vehicles produces an average cost of $64.61 per vehicle.

In the same year insurance premiums amounting to $176.6 million were paid to provide coverage against automobile accident losses. This was distributed as follows: Public Liability, Bodily Injury (including medical payments) $74.8 million; Public Liability, Property Damage,

[29] Vehicular: 186 to 653; Pedestrian: 0; Other: 31 to 74.

[30] .285 (167,337) = 47,703; .419 (14,997) = 6,284.

$39.5 million; and Collision and Comprehensive, $62.4 million.[31]

Amounts collected and not collected in settlements from insurers and others for such damages may be summarized as follows:

	Collected	Not Collected
Nonfatal bodily injury	$27,209,681	$ 8,791,485
Fatal bodily injury	7,281,150	2,675,650
Property damage	57,793,989	24,533,631
	$92,284,820	$36,000,766

Combining these data, it is apparent that accidents resulted in losses of $129.3 million, of which $92.3 million was recovered from insurers. In addition, net costs of insurance (the difference between premiums paid and recoveries) probably should also be considered as a cost of accident protection under the present system. Comparing total premiums and recoveries leaves a net insurance cost of $84.3 million, or $42.13 per registered vehicle. The total accident cost per vehicle, then, amounts to $106.74, including all damages, whether recovered or not ($64.61 per vehicle) and net costs of insurance ($42.13) after recoveries.

In making these computations one must note that recoveries includes payments by other parties and Blue Cross, Blue Shield, other accident and accident and health policies, workmen's compensation and unemployment compensation. Were this computed with greatest accuracy, these amounts would have to be deducted from recoveries or some weighted premium value added to costs. Altogether these items involve about 10.0 percent of the total recoveries. Making this adjustment would increase costs by a little over ten dollars per registered vehicle. Moreover, some payments for bodily injury, particularly, are in excess of the actual loss, e.g. pain and suffering. These also should be deleted from recoveries to arrive at a true cost base. Altogether this item was less than $1 per vehicle so its deletion would not seriously affect the total. On this basis, therefore, present accident costs including net insurance premiums (out of pocket) average between $105 and $120 per registered vehicle in New Jersey.

One must also note that these data hide the fact that a considerable proportion of those damaged in some manner did not receive insured recoveries, and that many of those who did recover got something less than their losses. Moreover, many who paid premiums and suffered losses did not recover, and properly so under the present system. The present burden is not shared equally by vehicles, drivers or victims. The real questions of loss must be studied in terms of specific cases if one is to measure burden and recovery in the individual context.

[31] The Spectator, Nov. 1956, p. 14 ff.

CHAPTER III

New Jersey Insurance Company Experience Sample

BECAUSE the sample sizes in some categories of the New Jersey victim survey were small, leaving a considerable range for error at 95 percent confidence limits, it was decided to seek supplementary information from a sample of the leading automobile insurance carriers in New Jersey. Accordingly, the twelve largest writers of automobile liability insurance by premium volume in 1955 were asked to provide information so that their experience could be compared with the results from the survey of victims of 1955 New Jersey automobile accidents. Eight of the twelve cooperated with this study.[1] Each of these companies furnished detailed information on all claims reported during the first week in May, 1955.

THE ACCIDENT UNIVERSE

For this week, the eight companies submitted data on 748 claims which were the result of 584 accidents. The great majority of these accidents were vehicular collisions. Since a sampling error of 3 to 4 percent may be expected at the .05 level of confidence, the sample may be assumed to have been drawn from the known police universe of types of accidents. (See Table 41.)

Location. Almost two-thirds of the automobile liability claims reported by the insurance companies were in urban areas. The observed differences as shown in Table 42 between the sample and the Traffic Safety Bureau universe are small enough so that the samples may be considered to have been drawn from the known universe.

Number of Vehicles. The company reports showed that over three-quarters of the collisions between vehicles involved two vehicles. Pedestrian, fixed object, and noncollision claims involving just one vehicle accounted for 15.4 percent of the claims reported. Almost eight percent of the claimants reported multiple-vehicular accidents of three or more vehicles. (See Table 43.)

Causes of Automobile Accidents. According to the companies' anecdotal records on the accidents represented by the claims filed during the first week of May, 1955, almost one-half or 48.1 percent were attributed to driver errors of judgment. Failure to observe signals, which accounts for most of the rear-end type collisions, was the second most frequent cause, accounting for almost one-fifth of the automobile accidents. Reckless driving (8.5 percent) and excessive speed (6.7 percent) together accounted for almost one-sixth of the accidents. It is also interesting to note that both the company records and victims included drunkeness as a cause in 1.5 percent and 2.1 percent of the cases, respectively.

The company and victim samples disagree on the proportions of accidents attributed to several causes. The victim sample shows a greater proportion caused by "weather and/or road conditions" than the company sample, 16.2 percent compared with 5.5 percent. Victims, on the other hand, attributed a higher percentage to "reckless driving," than did the companies, 21.7 percent to 8.5 percent, and a lower percentage to "insufficient clearance and/or poor judgment," 21.3 percent to 48.1 percent. Even if the latter two are combined to produce a total of 43 percent which might be termed "reckless driving by the

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[1]Twelve companies were asked to cooperate, ten agreed to participate but only eight were able to supply fully comparable data in all categories for use.

TABLE 39
Distribution of Recoveries by Source

Source of Funds	Number in Sample	Proportion	Percentage Using Source
Collected from own collision insurance	683	.394	39.4
Collected from other party's insurer	626	.362 + .005	36.7
Other party personally	70	.040 + .004	4.4
Both other party and other party's insurer	15	.009 - .009	.0
Did not collect[1]	337	.195	19.5
Total: Drivers and Owner of Damaged Vehicles	1,731	1.00	100.0

[1]The "Did not collect" category includes both those who paid for the damages personally and those who did not have the damages repaired. These latter have been included on the assumption that if all vehicles had been covered by insurance, the damages would have been repaired.

TABLE 40
Distribution of Losses Recovered, by Source

	Proportion Using Source	Amount Paid	Adjusted Percentage	Average Per Vehicle Registered
Own collision insurance	.394	$32,437,033	X	X
Less $50 deductible[1]	--	8,454,889	X	X
Net paid		23,982,194	29.1	$11.97
Other party's insurer	.367	30,214,237	36.7	15.10
Other party personally	.044	3,622,415	4.4	1.81
Did not collect	.195	16,053,886	X	X
Add: Cost of $50 deductible insurance		8,454,889	X	X
Total not collected		24,508,775	29.8	12.26
Total	1.000	$82,327,621	100.0	$41.15

[1]Proportion of those having damage to car from 0 - under 50 times total number of vehicles damaged times $25.00 = .0872 (176,807) ($25)= $385,439 plus difference between total number of vehicles damaged and number averaging $25.00 damage times $50.00 = (176,807 - 15,418) ($50)= $8,069,450. Total is $8,454,889.

TABLE 41
Nature of New Jersey Automobile Accidents
as Reported by the Company Sample for the First Week in May, 1955, Compared With the Adjusted Traffic Safety Bureau Universe of Accidents for New Jersey, 1955

Type of Accident	Eight Insurance Companies By Claimant	Eight Insurance Companies By Accident	Adjusted Traffic Safety Universe By Accident
Combined Total	100.0%[1]	100.0%	100.0%
Vehicular	79.3	79.3	80.8
Pedestrian	8.6	7.5	4.4
Other	12.1	13.2	14.8

[1]Fifty-two claimants, .7 percent, did not report the type of accident.

TABLE 42
Location of New Jersey Automobile Accidents
as Reported by the Company Sample for the First Week in May, 1955, Compared With the Traffic Safety Bureau Universe of Locations for New Jersey, 1955

Location	Companies	Traffic Safety Universe[1] Accidents	Persons Injured
Urban	62.4%	65.8%	61.2%
Rural and Off Public Highway	32.9	32.4	35.9
Turnpikes	4.7	1.8	2.9
Total	100.0	100.0	100.0

[1]See Footnote to Table 1

TABLE 43
Distribution of Numbers of Vehicles Per Accident in New Jersey as Reported by the Company Sample for the First Week of May, 1955

One Vehicle	15.4
Two Vehicles	76.8
Three or more Vehicles	7.8

TABLE 44
Causes of New Jersey Automobile Accidents as Reported by the Company Sample for the First Week of May, 1955, And Victims Covered by the 1955 New Jersey Automobile Accident Survey

Causes of Accidents	Companies	Victims
Weather and/or subnormal road conditions	5.5%	16.2%
Excessive speed	6.7	5.5
Mechanical failure	2.8	4.9
Failure to observe signal	18.6	12.7
Reckless driving	8.5	21.7
Insufficient clearance and/or poor judgment	48.1	21.3
Drunk	1.5	2.1
Pedestrian	2.6	2.8
Fell asleep	0.5	2.2
Other and unknown	5.2	10.6
Total	100.0%	100.0%

TABLE 45
Number of Persons Injured per New Jersey Accident during the First Week of May, 1955, as Reported by the Company Samples and by the Sample of Victims Covered by the 1955 New Jersey Automobile Accident Survey

Number Injured	Companies	Victims[1]
None injured	--	--
One person injured	46.7%	57.6%
Two persons injured	25.0	23.0
Three persons injured or more	28.2	19.5
Total	100.0%	100.0%

[1]See also Table 13.

victims," a similar combination for the companies would produce 56.6 percent, a significantly higher proportion. (See Table 44.)

One must be aware of the difference in sources of reports here. In the former case the victim is interpreting cause as he saw it, or rather as he interpreted it after the fact.[2] The companies, on the other hand, are describing accidents through the eyes of witnesses and interpreting their comments in the best light from their point of view. Obviously the victim must impute negligence to the other party if liability is to follow. Similarly, the company must establish fault and appropriate defenses to minimize or adjust the loss as economically as possible. Despite the differences in view, one cannot ignore the difference here, which is significant. Either company records or the victims' records or both are biased. The fact that the matrixes are otherwise similar in most physical respects suggests that this difference may be interpretative rather than real. Even so, the difference must be recognized and its effect considered in using these data.

Number of Persons Injured. Over one-half of the liability claims reported involved bodily injury, 51.8 percent. The remaining, 48.2 percent, were for property damage only. This is a smaller percentage than the number of property-damage-only vehicles is to the universe of damaged vehicles in the victim sample,[3] but was to be expected from insurance company reports because of failure to file claims for small amounts, elimination of claims where coverage does not exist (own vehicle without collision, e.g.), closure of claims because of fault, and no reports for uninsured sample results. (See Table 13.)

The insurance companies' sample shows a significantly lower proportion of accidents with only one injured and a higher proportion with three or more injured than does the sample of New Jersey accident victims. (See Table 45.) It may be that insurance claims are more likely to be made if several persons are injured or if costs are higher and/or that claims filed tend to include every possible loss in an effort to build the amount, or, possibly that a larger proportion of such claims were filed with insurance companies during the first week in May than for the whole year. On the other hand, it is possible, that the sample of victims of 1955 New Jersey automobile accidents indicates a lesser number because of more complete information concerning damage actually sustained at the time of the questioning two years after the accident by comparison with the claim file taken at the time of the accident. In addition, the victim sample may understate the number of persons injured per accident by omission of claims that would have been filed if all automobiles were insured. If the latter is the case, the victim sample experience understates the total cost of bodily injuries and the resultant averages per vehicle registered. The average number of persons injured per accident in the sample was computed as 1.73 per accident with bodily injury involved. The average according to the insurance company sample would be 2.38.

Types of Injuries. The data furnished by the company reports were insufficient to describe more than the location of the physical injury. Over one-third of the injuries involved more than one part of the body. Almost one-half of the injuries involved either the head or the torso. (See Table 46.) Because of sampling variability, a spread of approximately eight points might be expected between the two samples. The samples, therefore, are in agreement for all types of injuries except those of "head" and "torso," where the company sample shows significantly lower proportions of head and a higher proportion

[2]For an interesting commentary on this point, see Temple University, Bureau of Economic and Business Research, op. cit., pps. 24-26.

[3]See page 15.

of injuries to the torso than the victim sample.

Type of Automobile Accidents. Rear-end collisions were the most frequent type of accident reported, 23.5 percent being of this type. Over one-fifth (22.6 percent) of the accidents were intersection accidents. Side swipes also accounted for almost one-fifth (19.3 percent) of the accidents. In this sample over ten percent of the accidents reported involved pedestrians, a proportion which may be compared with 5.6 percent for the State as a whole and 3.5 percent for the victim sample. The difference is probably accounted for by the fact that bodily injury and, hence, a claim is almost certain to develop in a pedestrian incident, as compared with vehicular and other accidents where the proportion of bodily injuries is much lower. In this sense, the claims file would tend to overstate pedestrian as opposed to vehicular and other accidents as sources of claims. (See Table 47.)

Vehicular collisions are evident in 79.0 percent of the cases, a figure not significantly different from that reported in the victim sample. Other accidents, however, amount to 11.6 percent of the total, a significantly lower proportion than in the victim sample. The fact that less than half of all insureds carry collision insurance probably accounts for the low volume of claims on this count, compared with the victim sample. When these elements are considered, it appears that this universe is probably not greatly different from the victim sample.

Automobile Insurance Claims Paid

Over three-quarters (75.1 percent) of all the claims reported paid by the sample of companies involved property damage liability in some measure; over one-half (51.6 percent), only property damage liability; approximately one-quarter (24.9 percent), only bodily injury liability; and nearly one-half (48.4 percent), both bodily injury and, to some extent, property damage.

Respondents to the survey of victims of 1955 New Jersey automobile accidents indicated (Table 28) that 61.72 percent of settlements were for property damage. This percentage is understated if the universe is considered because property-damage-only victims were represented by a smaller proportion in the sample than in the universe. If the proportions are weighted by 1.32 for property damage only to one for bodily injury victims, as in Table 25, the percentages for settlement divisions become 65 percent for property damage, 18 percent for bodily injury, and 17 percent for medical payments. Because of sampling variability, the property damage settlement proportions from these two sources are not statistically significant. (See Table 48.) The proportions for bodily injury and medical payments are at variance, and significantly so. This can be explained in part by the sources of information. The proportion of medical payments settlements reported by victims in excess of $1,000 suggests misclassification of source. It seems more likely that many of these items were paid under the liability coverage for medical expense. Combining medical payments and bodily injury for both samples brings a closer relationship between results and reduces the sampling variability to proportions which are still considerable (about ten percent) but not statistically significant.

To obtain an average claim figure, $25,000 was used as the midvalue of the interval $10,000 and over because the range was from $10.0 thousand to $37.0 thousand. On this basis the mean bodily injury claim paid under liability by the companies for this period was $1,118. This compares with the average of $1,177 reported as settlements received for bodily injury claims by victims paid under liability in the 1955 New Jersey Automobile Accident Survey (Table 28). The means are not significantly different from each other. In the victim sample, however, 20.6 percent of the settlements were for less than $100 and 59.8 percent

were for less than $500, while for the company sample the comparable percentages were 31.9 percent and 69.2 percent. While with sampling variability these percentages are not significantly different statistically, the data suggest that the company settlements for that week were lower than might have been the case were annual averages used. In addition, however, the lack of precision with which victims distributed settlements may account for the difference. Medical payments and bodily injury claims may have been confused to some extent, as was noted above. This would tend to raise the proportion of lower settlements and to reduce the intervals, particularly those above $750 in the victim sample. Considering these facts, one may conclude that the samples probably are not only not different significantly in the statistical sense, but also are less unlike than they actually appear.

Three-quarters (74.2 percent) of the medical payments claims paid by the company sample were below $100. (See Table 49.) Only 3.4 percent of medical payment claims were above $500, and the highest medical payment paid was $693. (See Table 46.) On the other hand, the victim survey shows 35.1 percent below $50 and 51.07 percent under $100. In addition, there were 14.89 percent in excess of $500. It is believed, as noted above, that this results from some confusion in the respondents' concepts of medical payments and that this actually includes some liability settlements.

The arithmetic mean given by victims of accidents, $442 for medical payments settlements (Table 28), thus, is higher than the mean for the company sample, $105. This is because the highest payment made by the companies during the first week in May, 1955, was $693, while victims reported some payments of $1,500 and over, as noted above. The medians for the two distributions, however, are much closer, $93 for victims and $64 for the insurance companies.

When the two distributions, payments under bodily injury liability and medical payments are combined, the arithmetic means for the combinations are: $872 for the company data and $905 for the victim sample. Sample sizes were 243 and 154, respectively. These two means are not significantly different from each other.

Amounts of Property Damage Claims Paid. Data for the company sample indicate that almost two-thirds (62.5 percent) of the claims paid for property damage amounted to less than $100. This compares with 24.1 percent so reported by victims. If all claims under $300 are grouped, the proportions for the company and victim samples are 86.2 percent and 67.9 percent, respectively. Only 2.1 percent of the company sample of property damage claims but 6.2 percent of the victim sample were in excess of $750. The maximum property damage claim paid by the companies was $1,104.51 while that for the victims was over $3,000. (See Table 50.)

The arithmetic mean for property damage claims paid by the companies is $149. This is a lower mean that the $306 indicated by victims reportedly receiving property damage settlements. The difference results primarily from the fact that the highest claim paid by the companies was $1,104.51, while victims reported settlements in excess of $1,500. It may also be affected slightly by the fact that respondents misclassified some settlement data, although the greatest factor appears to be the absence of "total loss" and "new car" repair claims in the company sample, a fact which probably is due to the week of claims used. The medians also are widely separated, $75 for the company sample and $193 for the victim sample.

Claimant Retention of Counsel. Over one-fifth (20.5 percent) of the claimants reported in the company data retained lawyers to file their claims. However, only 6.6 percent of these claimants became involved in court proceedings. Among those claimants who retained counsel, almost one-third (32.0 percent)

TABLE 46
Location of Personal Injuries Received in New Jersey Automobile Accidents in the First Week of May, 1955, as Reported by the Company Sample and Victims Covered by the 1955 New Jersey Automobile Accident Survey

Injuries	Companies	Victims
Multiple Injuries	34.7%	30.5%
Head	19.4	29.5
Torso	26.1	14.0
Arm	7.7	8.2
Leg	8.1	8.5
Shock	4.0	9.3
Total	100.0%	100.0%

TABLE 47
Type of New Jersey Automobile Accidents Reported by the Company Sample for the First Week of May, 1955

Intersection collision	22.6%
Side swipe collision	19.3
Rear end collision	23.5
Head on collision	4.1
Backing collision	8.4
Pedestrian	10.5
Collision with fixed object	5.1
Other	6.5
Total	100.0%

TABLE 48
Payments for Bodily Injury Claims (Liability) from New Jersey Automobile Accidents Filed for the First Week in May, 1955 as Reported by the Company Sample and Victims Covered by the 1955 New Jersey Automobile Accident Survey

Bodily Injury Claims	Companies	Victims
Under $50	20.0%	13.4%
$ 50 - $ 99	11.9	7.2
100 - 199	14.0	14.4
200 - 299	11.4	13.4
300 - 399	9.2	7.2
400 - 499	2.7	4.1
500 - 749	8.6	12.4
750 - 1,499	8.1	10.3
1,500 - 1,999	1.6)	--
2,000 - 2,999	3.8)	
3,000 - 4,999	2.2)(14.1)	17.5
5,000 - 6,999	3.2)	
7,000 - 9,999	2.2)	
10,000 and over	1.1)	
Total	100.0%	100.0%

TABLE 49
Medical Payment Claims Paid for Claims from New Jersey Automobile Accidents Filed for the First Week of May, 1955 as Reported by the Company Sample and Victims Covered by the 1955 New Jersey Automobile Accident Survey

Medical Payment Claims	Companies	Victims
Under $50	39.7%	35.11%
$ 50 - $ 99	34.5	15.96
100 - 199	12.1	14.89
200 - 299	5.2	12.77
300 - 399	3.4	3.19
400 - 499	1.7	3.19
500 and over	3.4	14.89
Total	100.0%	100.00%

TABLE 50
Property Damage Claims Paid for Claims from New Jersey Automobile Accidents Filed for the First Week in May, 1955, as Reported by the Company Samples and Victims Covered by the 1955 New Jersey Automobile Accident Survey

Property Damage Claims	Companies	Victims
Under $50	37.6%	8.8%
$ 50 - $ 99	24.9	15.3
100 - 199	14.2	27.9
200 - 299	9.5	15.9
300 - 399	5.9	11.7
400 - 499	2.6	6.5
500 - 749	3.2	7.8
750 and over	2.1	6.2
Total	100.0%	100.0%

TABLE 51
Comparison of Automobile Accident Experience for Massachusetts[1] and New Jersey Under Various Assumed Conditions for 1955

	Massachusetts	New Jersey: Original Police Report	New Jersey: Adjusted Police Report	New Jersey: Insurance Company Original	New Jersey: Insurance Company Adjusted
Number of Bodily Injury Accidents	49,500	35,464[2]	25,880[3]	35,464[4]	28,880[4]
Number of Claims	78,873[5]	53,906[2]	49,681[3]	84,404[4]	68,734[4]
Claims per Accident	1.59	1.52	1.73	2.38	2.38
Average Payment on Loss per Claim	$ 514.00	$ 941.00[6]	$ 941.00[6]	$ 872.00	$ 872.00
Total Cost (thousands)	$40,541.00	$50,726.00	$46,958.00	$73,600,388.00	$59,996,048.00
Cost per Registered Vehicle	$ 33.36	$ 25.35	$ 23.46	$ 36.78	$ 29.95

[1]Massachusetts data are from the reports of Massachusetts Insurance Commission (See text).
[2]Survey of Victims of 1955 New Jersey Automobile Accidents, Table 1.
[3]Survey of Victims of 1955 New Jersey Automobile Accidents, Table 5.
[4]Ratio obtained from New Jersey Insurance Company Sample multiplied by the number of accidents yields the number of claims expected.
[5]The Massachusetts Vehicle Reports shows 82,488 injured. However the number of insurance claims has been used in the computations.
[6]Survey of Victims of 1955 New Jersey Automobile Accidents, Table 35. Total costs of bodily injuries divided by the total number injured as estimated from the victim sample. The average settlement received by persons having claims against the other party was $1,177; if medical payments are included in the total, the average was $905.

became involved in court proceedings. Of the court actions started, less than one-half (46.9 percent) were completed. The balance were withdrawn before the point of liability decision by the court. Only 3.1 percent of all claimants actually completed the routine of court proceedings. Among those claimants completing court action, almost two-thirds (65.2 percent) were granted liability judgments against the insured defendent while approximately one-third failed to obtain court awards against the insured defendents.

The victim survey showed 34.96 percent as having hired lawyers, 22.08 of the total going to suit, and a little less than half, 10.53 percent, to trial. Of these, 69.6 percent won awards; 30.4 percent did not. These are somewhat larger proportions than are reported by the insurance companies, but logically this might be expected, since the insurance sample contains claims only for accidents covered by insurance, whereas the victim sample includes those not insured. In addition, not all insurance companies follow the same settlement procedures, some forcing larger proportions of their claims to trial than others.[4] It is probable that the victim is more likely to retain a lawyer if the other party is not insured. Judgment was for the victim in 69.5 percent of the cases, a figure about the same as that reported by the companies.

SUMMARY

Comparison of the responses of the samples of insurance companies and victims of 1955 New Jersey automobile accidents shows considerable areas of both agreement and disagreement. In general the samples agree as to types and locations of accidents. There is general agreement on type of injuries, with the exception that the company sample shows a larger proportion to the torso and a smaller percentage to the head than the victim sample. In causes of accidents, companies report a smaller proportion of accidents caused by "weather and/or road conditions" and by "reckless driving," but a larger proportion by "insufficient clearance and/or poor judgment." According to the companies, too, a somewhat smaller proportion of claimants hired lawyers and went to court. Some of these differences were to be expected, as has been pointed out, when consideration is given to the fact that the company sample covered only one week and included only claimants involved in accidents covered by insurance, while the victim sample covered a full year and included all accidents.

There were some areas of disagreement which would change the losses and costs if these company data are more representative of the universe. Companies, for example, indicated a greater number of persons injured per accident than did the victims, 2.38 as compared with 1.73. Although the mean values of paid claims and of settlements to victims for bodily injuries are not significantly different, the larger number of persons injured would increase bodily injury costs per registered vehicle to $29.95 as compared with the victim sample cost of $23.46. If numbers in the original Traffic Safety Bureau report (Table 1) are used, the cost per registered vehicle would be $36.78. (See Table 51.) In the cost data subsequently, separate costs estimates will be prepared using both assumptions. If Massachusetts data can be used as a guide, the company results are more nearly accurate. In this case, as in the company sample, insurance coverage was certain and provided a source of settlement which the injured victim could attack with the knowledge that financial capacity existed. In this sense, the higher loss rate is probably the more accurate, both as a statement of losses and as a basis for computing costs if compulsory coverage of some sort were to be used.

[4]See Temple University, Bureau of Economic and Business Research, op. cit., pp. 47-51.

On the other hand, companies show a smaller mean payment than the victim sample for property damage claims, $149 as compared with $306. If the insurance average were used to compute total costs of property damage, such losses would be approximately 50 percent less than those shown by victims. Again using Massachusetts as a guide and considering the limitations imposed by a one-week sample, it appears that the data for the companies may understate vehicular losses both because of time (not all types of accidents reported) and because only insured losses are presented. Data for both loss patterns are presented subsequently. Acceptance of either one appears to lead to some under or overstatement of losses. A range within which probable experience will place the actual cost, however, does result.[5]

[5]Detailed cost estimates, by hypothesis, together with limitations, may be found in Chapter V.

CHAPTER IV

Other Systems of Providing Financial Security for Persons Damaged by Automobile Accidents

THE preceding chapters have given an indication of the effectiveness of the present system for dealing with the financial consequences of automobile accidents in New Jersey (1955). One may be moved to ask whether the system is the most effective means either for financing damages or for dealing with this type of casualty and the resultant problems. No final answer to that question can be provided in a monograph such as this, but some indication of costs and results under other systems may suggest differences both in method and cost which will bear more detailed inquiry.

In opening this line of inquiry, following the purpose of this study, it must be clear that the objective is to examine critically costs and methods of meeting them. This study advocates no plan. Its purpose is to evaluate techniques and set forth structures in such fashion that those interested may find a factual basis for considering these systems comparatively.

INTRODUCTION

Several principal alternatives to the present system of financing automobile accidents exist. Among them are: (1) Establishment of a system of compulsory liability insurance for all vehicles and/or motorists, or both; and (2) Establishment of a compulsory compensation system, doing away with questions of negligence and liability and providing a system for compensating victims by schedule for damages suffered. One could argue that there are other possible solutions to the problem including return to a pure liability system, direct accident insurance, and many other variations on those named. For the purposes of this study, the examination has been limited to the three principal operating systems of the present.

In each of the cases listed above, one could prepare an extended brief arguing for or against the system on various grounds. Certainly there are differences in principle among them which are important. Similarly one could establish various legal and other criteria of effectiveness and, in these terms, make a case for or against each system. As noted earlier, such is not the purpose of this study. Here the financial results, including some operating details, are all that will be treated.[1] The purpose in examining data and these operating systems is to cast hypotheses for computing costs, assuming the adoption of such systems in New Jersey. No details unnecessary for that purpose are included in the discussion, although legislation, operations and other data, all were studied in preparing the basic materials.[2]

COMPULSORY LIABILITY—MASSACHUSETTS

One of the first alternatives to the present system which occurs to anyone is a system of compulsory liability insurance, which assures that all vehicles are financially capable of meeting minimal damage claims, at least. Such systems now operate in two states, New York and Massachusetts. At the time of this study the New York System had just been enacted; it did not cover the year 1955, however. Accordingly, Massachusetts was the only universe available for examination. This system had been in effect since 1927 and appeared to the

[1] One minor exception is the Saskatchewan System where, because details of its operation are not as easily available, a short description of the program is included.

[2] As noted in the Introduction the resources for the study were not great enough to permit exploring all of the possible avenues nor to permit an extended write-up of the work. Accordingly, much interesting information not bearing directly on the problem has been eliminated from these descriptive analyses.

writer to be a more or less permanent technique for dealing with the problem of the irresponsible motorist in that state.

The Massachusetts law (1955) requires evidence of bodily injury liability insurance on all automobiles before those automobiles may be presented for registry and license plates. Only bodily injury liability coverage, however, is mandatory; property damage and guest coverage may be demanded of the insuring company by law, but such coverages are not conditions precedent to eligibility for vehicle registration. The Massachusetts law requires bodily injury liability amounts of $5,000 per person injured and $10,000 per accident. It should be recognized that the compulsory liability insurance required in Massachusetts need only cover liability incurred while on the "ways of the Commonwealth," a somewhat narrower coverage than national standard policies.[3]

Massachusetts
Rate Making

In Massachusetts, the sole rate-making authority for compulsory automobile liability insurance is the Insurance Commissioner. The law directs that the Commissioner set compulsory rates annually for the succeeding calendar year. The Commissioner is required to hold a public hearing between the date on which he announces his proposed compulsory rates and the date on which he promulgates them finally. This usually takes place in the fall, subjecting the rate making to many pressures.

As the procedure now is carried out, the private insurance companies operating in Massachusetts recommend changes in the rates annually. The Commissioner customarily modifies the change "in favor of" the public. However, according to the stock casualty companies' trade association, if the companies had been granted the rate increases they had recommended during the six-year period from 1951 through 1956, the actual paid losses still would have exceeded the provision for losses in the rates.

The following figures indicate the 1951-1958 rate changes from the previous year promulgated by the Commissioner and the rate changes recommended by the Companies:

Calendar Rate Year	Rate Changes Recommended By Companies	Rate Changes By Commissioner
1951	+05.8	+02.9
1952	+22.0	+08.6
1953	+36.9	+17.7
1954	+19.2	+09.3
1955	−03.0	−06.3
1956	+11.3	+05.3
1957	+22.0	+19.6
1958	+25.0	+09.1

Massachusetts Compulsory Rates, 1955

Although there had been some increase in auto liability claim frequency in late 1954, the Commissioner promulgated a 6.3 percent decrease in rates for 1955. The earned premium loss incurred ratio for passenger car liability was indicated to be 81.1 percent. Out of an exposure of 1,214,793 car years, the number of claims was 78,873; the average claim cost was $514; the claim frequency was 6.5; the pure premium would have been $33.36 per car per year.[4]

This would compare with $25.35 per car in New Jersey, if numbers of accidents and injured according to the original police report were used with the victims' sample costs, $23.46, per the victims' sample, and either $36.78 or $29.95 if computed from information in the insurance company sample, depending upon whether the number of accidents from the original or from the adjusted police report is used. (See Table 51.)

Since property damage insurance is not compulsory in Massachusetts, no

[3]Bodily injury liability policies in New Jersey normally provide coverage both "on" and "off" the ways of the State and include a guest occupant coverage.

[4]The earned premium for 1955 was $50.0 million, total losses incurred were $40.5 million. These data were furnished by M. G. McDonald, Casualty Actuary, and were taken from an unpublished report entitled, **1956—Private Passenger Car Experience, Massachusetts. (Second Report).** It is notable that McDonald recognized a considerable difference between the Reports of the Motor Vehicle Register and those of the Commission, and indicated that he could not reconcile them specifically.

comparable costs could be obtained. However, the Massachusetts vehicle report shows 25,981 property-damage-only accidents out of a total of 75,481 with an average number of vehicles on the road of 1,415,785. The original police report in New Jersey indicates that there were 63,113 property-damage-only accidents out of 98,577, while the adjusted report from New Jersey accident victims' responses shows 56,834 out of 98,577. In both cases, there is a higher proportion of property-damage-only accidents in New Jersey than in Massachusetts.

This may be due to a difference in the criteria used in classification or it may be a result of the pattern of claims filed in a state where compulsory liability insurance covering personal injury claims exists. It is notable that the average claim in Massachusetts is considerably lower than in New Jersey, regardless of universe used comparatively, which suggests that more claims, particularly small claims, are filed in an effort to recover some part of the loss, including property damage, from the accident.

COMPENSATION

A second basic alternative to the present system which has been discussed widely for thirty or more years is a compensation system. Attention was first focussed on this type of program by the **Report** of the Columbia Council Study[5] in 1932. Since then, many others also have studied this alternative method of insuring accidents, some concluding that it would be desirable, others not.

The essence of a compensation system as applied to automobile accidents is the establishment of the principle of settlement on proof of loss without regard to liability. In return for making settlement certain, limitations on settlement or scheduled benefits are normally provided, as in the standard Workmen's Compensation form.

Some of the proposals for coverage suggest use of the compensation principle for bodily injury only, others would cover all losses in this fashion. Workmen's Compensation is an example of the first condition; the Saskatchewan program provides an example of the second. For the purpose of this study, both of these types of provisions have been included.

New Jersey Workmen's Compensation Law

One model for examining the provisions of compensation as they would affect automobile accident victims is found in compensable accidents covered by the New Jersey Workmen's Compensation Law. Both the actual experience for 1955 and the provisions of the law in 1955 were examined. The actual experience serves as a cost model where incidents are appropriate. The provisions of the law are used to estimate cost where there is no experience upon which to draw from the 1955 compensable accident universe. This section, therefore, is divided into three parts: (1) A summary of the Workmen's Compensation provisions in 1955; (2) Financial experience of automobile accident victims covered by Workmen's Compensation in 1955; and (3) Applications of these data to the 1955 victim sample experience to estimate costs assuming that these provisions were applicable to all auto accidents.

Workmen's Compensation Law, 1955

The compensation provisions of the Workmen's Compensation Law in effect in 1955 were taken from the Statutes as revised to January 1, 1951, and the subsequent amendments.[6] The provisions

[5]Committee to Study Compensation for Automobile Accidents, **Report**, prepared for Columbia University Council for Research in the Social Sciences, Columbia University Press, 1932.

[6]State of New Jersey, **Workmen's Compensation Law, Revised Statutes 1937, Title 34, Chapter 15, Articles 1 to 7, Inclusive (R.S. 34: 15-1 to R.S. 34: 15-120) As Amended and Supplemented to January 1, 1951**, Percy A. Miller, Jr., Commissioner of Labor and Industry, MacGrellish & Quigley Co., Trenton, New Jersey, 1950. See also Bureau of Industrial Statistics, **New Jersey Industrial Directory, 1956-7**, pp. xxxv, xxxvi.

are technical and are designed to cover a number of industrial situations. For the purpose of this study it is assumed that compensation will follow from proof of loss and that the only necessary data are the schedules of compensation. Accordingly, these data only are summarized here.

The law divides disabilities resulting from accidents into three types: "temporary," "permanent total" (disability total in character and permanent in quality),[7] and "permanent partial" (disability partial in character, but permanent in quality).[7]

Compensation provided was as follows:

1. For injuries resulting in temporary disability, the victim is to receive 66 2/3 percent of the covered wages being earned at the time of the injury, subject to a minimum of $10.00 and a maximum of $30.00 per week, but for not more than 300 weeks.
2. For injuries resulting in permanent total disability, the injured person is to receive 66 2/3 percent of covered wages earned at the time of the injury, subject to a minimum of $10.00 and a maximum of $30.00 per week. After 450 weeks, the case is to be reviewed. The individual is supposed to have undergone physical and educational rehabilitation during the period, and compensation is to be reduced if the victim has become capable of earning wages.
3. For injuries resulting in permanent partial disabilities, 66 2/3 percent of covered weekly wages earned at the time of the injury, subject to a minimum of $10.00 and a maximum of $30.00, the length of time to vary according to the extent of the injury, but not to exceed 550 weeks. Compensation is paid according to schedule, as follows:

Part Lost or Type of Loss	Number of Weeks of Compensation
Thumb	75
Index finger	50
Second finger	40
Third finger	30
Fourth finger	20
Phalange	Half of time for thumb or finger
Great toe	40
Other toes	15
Phalange of toe	Half of time for toe
Hand, thumb and two fingers or four fingers	230
Arm	300
Foot	200
Leg	275
Eye	150
Enucleation of eye	25 plus compensation for loss of eye
Tooth	4
Hearing one ear	60
Hearing both ears	200
Both hands, arms, feet, legs, eyes, etc.	Considered permanent total disabilities

The 1955 law provided that in the event of the death of the person receiving compensation from causes other than the accident (or occupational disease), remaining payments due for permanent disability were to be paid to dependents or, if there were no dependents, the remaining amount due (450 weeks for permanent total disability) but not in excess of $250.00 was to be paid for funeral expenses.

In the case of death as a result of the accident (or occupational disease), medical, hospital, and funeral expenses (not to exceed $250.00) were to be paid. In addition, dependents were to be paid a percentage of the victim's wages for 300 weeks or until reaching the age of eighteen, whichever was longer. Payments to dependents were subject to a minimum of $10.00 and a maximum of $30.00, the actual amount varying according to the number of dependents as follows:

Number of Dependents	Percentage of Wages
1	35
2	45
3	45
4	50
5	55
6 or more	60

For injuries not resulting in death, medical and hospital services were to be paid by the employer but not in excess of $50.00. If, however, the victim petitioned the Workmen's Compensation Bureau (now called the Division of Workmen's Compensation) showing need and that the costs were "reasonable," the employer could be required to pay more. (For this study this provision has been modified to include total medical expenses as paid.)

[7] Ibid., p. 12.

Compensable Cases Closed During the Year Ending December 31, 1955

Data are not available on cases incurred during the year 1955, as such. All department records are kept on a "cases closed" basis and financial records show only payments incurred during the year. Data available, thus, are not strictly related to 1955 accidents but rather refer to closures in that year.

Application of the law to compensable cases closed during the year ending December, 1955, resulted in the data shown in Table 52.

Although the number of claims arising from vehicular accidents was only 4.15 percent of the total, both the number of days lost and the compensation paid for vehicle accidents were relatively more than twice as great, 9.62 percent. A similar relationship, but not quite twice as great, may be observed between number of cases reporting medical costs and the actual costs, 3.33 percent and 6.40 percent.

When the number of cases is divided into the dollar values, costs per case are: average compensation for all cases, $618.06; for vehicle cases, $1,350.81; average reported medical costs for all cases, $123.86; for vehicle cases, $238.04.

Workmen's Compensation Costs and Bodily Injury Accidents

The average costs of medical expenses and compensation related to compensable vehicular accidents, $238.04 and $1,350.81, were then used as a basis for estimating costs for the State of New Jersey accident universe, four different hypotheses being used so as to permit comparison of costs per registered vehicle for bodily injuries under various assumptions.

The first universe shows number of accidents and total injuries as reported by the New Jersey Traffic Safety Bureau in their original report (Table 1 of Victim Sample). However, since the report does not separate primary victims from dependents, the proportions of primaries and dependents derived from responses received in the survey of victims of 1955 New Jersey automobile accidents were used to estimate the numbers shown for the four universes. The numbers of primaries with medical costs for all universes have been computed by using the ratio of those with reported medical costs to total compensation cases (484 divided by 2,006) as indicated by the report for Workmen's Compensation, 1955. This ratio was multiplied by the number of primary individuals injured. All dependents have been assumed to have medical expenses. However, there would be very little, if any, compensation for wage losses for dependents. Payments for death in the case of dependents have been assumed to be $5,000. This is an arbitrary value, but because of the small number of cases, it has little effect on the final average cost per vehicle registered. Each $5,000 additional assumed would increase the per vehicle average by only 20 cents. Under these assumptions, the total cost of bodily injury accidents including medical expenses, related expenses, and wage losses would be $30.18 per vehicle registered. (See Table 53.)

The second universe has been derived from responses to the survey of victims of 1955 New Jersey automobile accidents (Table 5). Because both the number of accidents and the number of persons injured are smaller than in the original police universe, the average per vehicle registered is smaller, $27.84 compared with $30.18. These reductions are based on the detailed comparison of traffic reports and victim responses which showed less bodily injury damage in the ultimate than in the Bureau Reports. However, it must be recognized that neither the Bureau record nor the victim survey include all accidents, although bodily injury, if of any consequence, presumably is listed in both. In the last analysis, it appears that these data understate the actual, to some extent, probably small in the case of bodily injury.

The two universes are based upon the New Jersey State Bureau of Traffic Safety records and the victim sample as adjusted by company experience. It will be remembered that in the sample of insurance company reports it was found that a greater number of persons was injured per accident than either the Bureau or victim sample indicated. If this ratio, 2.38, as compared with the victim sample ratio 1.73 and the unadjusted police universe with 1.52, is used with the Bureau and victim sample bases, the costs of $38.42 and $46.89 per registered vehicle emerge for the modified universes. (See Table 53.)

Other bases might have been adopted, as, for example, application of the law to the injuries sustained. Inadequate information on days lost, level of compensation per week and medical expense were available to permit arriving at a sound cost figure on this basis. However, in the cost summary, subsequently, some modifications for this type of calculation are suggested and relative cost differences are estimated.

AUTOMOBILE ACCIDENT COMPENSATION—SASKATCHEWAN

The problem of recovery of financial losses due to automobile accidents has been handled through the development of a unique auto insurance plan by the government of the Province of Saskatchewan, Canada. There the compensation technique has been adopted and all drivers and cars are covered, as a matter of law, by an insurance policy provided and underwritten by the Province Government,[8] and required as a condition of license.[9]

This approach is typical of the compensation principle in that it proceeds from the view that losses should be indemnified regardless of fault. Accordingly, the law requires a base coverage and provides a schedule of indemnities payable under specifically designated circumstances. However, the Saskatchewan law also provides that a victim may seek additional damages where he believes there was fault or criminal negligence on the part of the other driver. In this event, however, any adjudicated damages are reduced by the compensation paid.[10]

As noted, the Saskatchewan law requires coverage of all vehicles as a condition of license and use. However, the owner is required only to provide the minimum coverage. Additional coverages, including higher liability limits, may be acquired either commercially or from the Government Insurance Office. There are no exceptions to the requirement of basic coverage nor can there be any if the system is to work. Some of the details of this program are presented below.[11]

Background of the Plan

One of the reasons for developing material concerning the Saskatchewan program originally was that it was believed that it could be used as an actual case study and model, provided technical data were available to support it, at least as a basis for an hypothesis for a compensation plan for New Jersey. However, a careful examination of the background and development of the Saskatchewan Automobile Accident Compensation Program, the physical, demographic, and geographic facts of the Saskatchewan universe, the evolution of the program itself, and an evaluation of the techniques in use in Saskatchewan, made it apparent that its parameters — social, economic and physical — are so different

[8] The Saskatchewan law is modeled on the proposal developed in full by the Columbia University Study, 1932, previously cited.

[9] The insurance is sold with the license; one cannot be purchased without the other.

[10] Where such recovery occurs, the Government Insurance Office recovers any amounts paid to the victim from his settlement. In fact, the Government Insurance Office also insures liability. Thus, in effect, this merely involves reducing the ultimate settlement.

[11] Greater detail concerning the program is presented in this case than was true for Massachusetts or the Workmen's Compensation Program in New Jersey. This has been done because this program is unique, and because details on it are not as readily accessible; however, no attempt is made to spell out all details of the program nor to evaluate it.

TABLE 52
Total and Vehicle Accident Cases Closed Under Workmen's Compensation for New Jersey, 1955

Number of	Total	Vehicle	Vehicle Accidents as A Percent of Total
Claims	48,369	2,006	4.15
Days Lost	10,244,384	985,227	9.62
Cases Reporting Medical Costs	14,542	484	3.33
Compensation Paid	$29,894,982	$2,709,729	9.06
Medical Costs Reported	$ 1,801,244	$ 115,210	6.40

Source: State of New Jersey, Department of Labor and Industry, Carl Holderman, Commissioner, Industrial Accident Report, Compensable Cases Closed During Year Ending December, 1955, Division of Workmen's Compensation, Trenton, New Jersey.

[1]For the purposes of this act, dependents are defined as: husband, wife, parents, step-parents, grandparents, children, stepchildren, grandchildren, child in esse, posthumous child, illegitimate children, brothers, sisters, half-brothers, half-sisters, niece, nephew, legally adopted children. Dependency was presumed as to the decedent's widow and natural (or adopted) children under 18 years of age who were a part of the decedent's household at the time of the death. Others would have to prove dependency.

TABLE 53
Workmen's Compensation Average Costs Applied To Various Universes of Bodily Injuries, 1955

Number, Total Costs and Cost for Registered Vehicle	Universe: Unadjusted Per New Jersey Police	Universe: Adjusted Per Victims Responses	Insurance Companies' Ratio of Number Injured: Unadjusted	Insurance Companies' Ratio of Number Injured: Adjusted
Number of Accidents with Bodily Injury	35,464	28,880	35,464	28,880
Persons Injured (including fatal)	53,906	49,881	84,404	68,734
Primaries	40,300	37,290	62,678	51,386
With Medical	9,724	8,998	15,124	12,399
Dependents	13,606	11,800	21,726	17,348
With Medical	13,606	11,800	21,726	17,348
Fatal	79	79	79	79
Total Costs	$60,386,116	$55,717,461	$93,832,843	$76,888,699
Primaries	56,752,344	52,513,589	88,366,186	72,364,181
Medical	2,314,701	2,141,884	3,600,117	2,951,458
Compensation	54,437,643	50,371,705	84,666,069	69,413,723
Dependents	3,633,772	3,203,872	5,566,657	4,524,518
Medical	3,238,772	2,808,872	5,171,657	4,129,518
Fatal	395,000	395,000	395,000	395,000
Average per Registered Vehicle	$ 30.18	$ 27.84	$ 46.89	$ 38.42
Primaries	28.36	26.24	44.11	36.16
Medical	1.16	1.07	1.80	1.47
Compensation	27.20	25.17	42.31	34.69
Dependents	1.82	1.60	2.78	2.26
Medical	1.62	1.40	2.58	2.06
Fatal	.20	.20	.20	.20

TABLE 54
Financial Experience of the Saskatchewan Government Insurance Office with the Automobile Accident Insurance Act (in thousands)

Year	Premiums Earned	Losses Incurred	Expenses Incurred	Annual Surplus	Cumulative Surplus
1946-47	$1,300.5	$ 299.0	$147.6	$ 767.3	$ 767.3
1947-48	1,456.7	978.6	214.1	252.7	1,020.0
1948-49	1,546.0	1,198.7	331.6	65.2	1,085.1
1949-50	1,955.2	1,719.8	372.2	86.6*	998.5
1950-51	2,186.7	2,042.5	498.2	327.1*	671.4
1951-52	2,390.7	2,627.6	516.7	731.5*	60.1*
1952-53	2,731.5	3,785.7	572.9	1,599.9*	1,660.0*
1953-54	5,135.2	4,647.6	747.6	206.5*	1,866.4*
1954-55	6,862.5	2,649.9	953.3	3,271.7	1,405.3
1955 Jan 1-Dec 31	5,919.7	2,904.4	844.7	2,203.6	2,694.5

Source: Saskatchewan Government Insurance Office.

*Deficit or negative surplus.

TABLE 55
Percentage Distribution of Accidents, Classified by Type of Accident and by Type of Loss for Saskatchewan and New Jersey (Adjusted Universe) 1955

Type of Accident	Total	Type of Loss: Total	Total Bodily Injury	Nonfatal	Fatal	Property Damage	No Injury
Saskatchewan Total	100.00%	--%	--%	--%	--%	--%	--%
Combined Total		100.00	21.82	20.60	1.22	78.18	--
Vehicular	63.92	100.00	14.26	13.55	0.71	85.74	--
Pedestrian	2.80	100.00	98.42	92.49	5.93	1.58	--
Other	33.28	100.00	29.89	28.10	1.79	70.11	--
New Jersey Total	100.00	--	--	--	--	--	--
Combined Total		100.00	29.29	28.56	0.73	57.66	13.09
Vehicular	80.77	100.00	22.82	22.52	0.32	64.15	13.00
Pedestrian	4.42	100.00	74.73	74.19	5.37	19.06	20.44
Other	14.80	100.00	47.87	46.27	1.60	39.44	11.09

from those of New Jersey that no real basis for comparison existed. Nonetheless, the data on the Saskatchewan plan will be treated briefly as an interesting case study.

There is, practically speaking, no basis for comparison or the drawing of parallels between the Saskatchewan and New Jersey universes. Saskatchewan covers a geographic area three times the size of New Jersey and there were less than 300,000 vehicles on its highways in 1955 by comparison with over two million in New Jersey. The largest city in Saskatchewan had a population of about 80,000, while in New Jersey the metropolitan areas around Newark and Philadelphia both involve millions of people. Speedways, turnpikes and freeways cover New Jersey, while rural roads are the rule for Saskatchewan. Thus, there is little basis for relating the program experience for automobile coverages under these two sets of circumstances.

Moreover, a detailed examination of the financial statistics for the methodologies adopted by and used in Saskatchewan, although eminently sound and satisfactory under the circumstances there evident, indicates that such would be wholly unsatisfactory under the legal requirements and with the insurance concepts in use in New Jersey. Thus, there is no basic methodology in use for estimating costs which would suggest a means for creating an actuarial model for the New Jersey universe. This is not to say that there is no actuarial system in use in Saskatchewan, nor even that the method in use is wrong. Indeed, detailed work has been performed by the statistical division of the Government Insurance Office, including the construction of some actuarial hypotheses. However, in the rural setting of that Province the use of loose forecasting methods and ex post facto rate adjustments, always possible where government provides continuity and security, sometimes by rule of thumb, has been adequate.

Over the years that the program has been in operation, it is evident that as reserves increased, coverages were increased; that as losses exceeded receipts, premiums were increased. It is also evident, however, that a basic methodology for costing the program within the limits of the compensation framework has been evolved during this period, and that the methods now in use, although they could hardly be classed as actuarial models in the finest technical sense, do provide a reasonably sound basis for rate determination.[12]

It must be clear that these statements are not meant to be a technical criticism of the Saskatchewan insurance plan, but rather are statements of fact concerning its operations which have led to the conclusion that the systematic observation of the accident experience and their financial results in Saskatchewan cannot form the basis for sound model construction in New Jersey.

History of Saskatchewan Insurance System

Some background on the development of the Saskatchewan plan may be helpful in understanding its operation. Its formal evolution began in September, 1945, when the minister in charge of the Saskatchewan Government Insurance Office directed the organization of an interdepartmental committee to study the problem of motor vehicle license insurance in Saskatchewan. That committee did a considerable job of research in the field and prepared a detailed report presenting (1) physical and financial problems created by automobile accidents as they appeared in Saskatchewan; (2) the field

[12]In this connection, it may be noted that the Saskatchewan Government Insurance Office offers package "all risk" policies in addition to the so-called license insurance, which are, in effect, commercial coverages and which compete with those offered competitively by commercial carriers to supplement the license insurance plan. In this area, the Saskatchewan Government Insurance Office and the private carriers both have promulgated rate structures which are roughly parallel, a fact which suggests use of model construction techniques comparable to those used elsewhere. It may also suggest that the Government Insurance Office, as the monopoly carrier of the basic coverage, is setting a pattern which commercial carriers must also offer if they are to compete.

of insurance and insurance practices as they related to automobile accidents; and, (3) a proposed plan for dealing with the financial problems relating to automobile accidents. Their report was presented in June, 1946.

The committee report concluded that the financial problems arising out of automobile accidents were considerable and that steps to remedy them were essential. After examining compulsory liability and financial responsibility statutes and the experiences of some of the American states with these statutes, this Committee rejected both as solutions.[13]

The alternative which the Committee proposed was a plan to provide for a uniform compulsory compensation coverage, not unlike that proposed by the Columbia Study in 1932. In making this proposal, the Committee examined various procedures under which such plan might operate. It was concluded that the plan could be most effectively operated by the Government Insurance Office with the government serving as a monopoly carrier insofar as the basic coverage was concerned.[14] The Committee then conducted a very careful study of the constitutionality of their proposal, and, after documenting their position both on this point and on the requirement that there be an obligatory insurance coverage purchased by each motorist residing in the Province, they proceeded to outline a plan.[15]

The Committee then prepared a detailed report analyzing the basic problems and features of a plan designed to deal with them. Its recommendations were the subject of considerable study by the legislature during its 1946 ses-

[13]To indicate some of the flavor of the report, the following quotations from **A Report on the Study of Compensation for Victims of Automobile Accidents,** February, 1947, p. 63, is included.

"The automobile performs an essential function in the modern economy. It is a dangerous instrument which, out of control for the minutest space of time, may cause great damage. As stated earlier, every motorist is, because he is human, negligent at some time or other while on the highway and it is largely a matter of fortune whether or not someone is in a position to suffer injury through his neglect at the time.

"At common law, the most that such a motorist could hope for was that the person injured was himself negligent in such a way as to contribute to the accident, for then, the injured party could recover nothing. The most that the injured party could hope for was that the man who caused the injury was wealthy or insured.

"The application of the law in any particular case has proved a complex process and rendered the administration of justice somewhat uncertain. One attempt to alleviate the problem is found in the uniform Contributory Negligence Act which requires the court to apportion the degrees of fault between those responsible for the accident, and to fix the damages accordingly. But even this does not assist the person who obtains a judgment against one who is financially irresponsible, nor does it relieve the unfortunate motorist, who has to part with the little property he has been able to accumulate through a lifetime of hard work in order to pay a judgment obtained against him because he was momentarily careless on the highway.

"In 1944, there were 180,959 drivers of 140,977 motor vehicles in Saskatchewan and less than 12% of these vehicles carried public liability insurance. This public liability insurance guarantees the recovery of damages by a third person who is injured as a result of the negligence of the insured but even though every owner and driver of an automobile carried public liability insurance, it would mean that on the average less than one out of every two people involved in a motor accident would recover, since only the innocent victims would recover and the negligent person would not. Members of the insured's family can never recover under a policy for damage caused by the negligence of the insured."

[14]The Committee concluded, "Since the Committee can find no possible way for developing the concept of public liability insurance to the point where it might be made effective as a solution to the problem of uncompensated victims of automobile accidents, it has been driven, as indicated earlier, to a fresh approach. The pain and suffering of the victim cannot adequately be measured in monetary terms. The economic consequences of disability are real—detrimental to the economic welfare of the individual as well as to society—irrespective of whose fault caused the accident. Economic loss consequent upon unemployment and industrial accident has become recognized as a factor in the cost of production in industry. Economic loss, consequent upon old age has become recognized as a factor in the cost of operating organized society. The Committee has concluded that the economic loss consequent upon the disability caused by motor vehicle accidents should properly be recognized as a factor in the cost of operating vehicles on a highway. All motorists should bear the cost and all victims should be compensated to the extent necessary to maintain a minimum standard of decency during the period of disability or re-adjustment." See **Ibid.,** p. 71.

[15]For a detailed treatment of the legislative basis for this program under the constitution of Canada and the Province of Saskatchewan, see **Report on the Study of Compensation for Victims of Automobile Accidents,** prepared by the special committee of the Saskatchewan Government, appointed to study the problems of automobile accidents, February, 1947, pp. 63-71.

sion and resulted in the passage of the Automobile Accident Insurance Act of 1946. In this report the Committee concluded:

> "It is, of course, too early to determine the adequacy of the legislation to meet the problem for which it was designed but it is significant that four months after the date of the law becoming effective, no dispute between the Government Insurance Office and any injured person has yet found its way into the court. The policy of the Insurance Office has been to administer the Act according to its spirit rather than to the strict technical meaning of the words employed. As has been indicated in earlier sections of this report, the Committee is conscious of certain inadequacies and it considers that after a little experience, the legislation should be widened as there indicated. Of course, whether the results in terms of alleviation of human distress justify the financial cost to the motorist is a question which will be answered in the mind of each individual according to his own scheme of social values."[16]

The Insurance Act of 1946 superseded the Automobile Act of 1945, passed by the Legislature for the purpose of establishing a line of financial responsibility to owners, operators, and chauffeurs of motor vehicles. This act was typical of the financial responsibility statutes, depending upon suspension of license for both the operator and the vehicle until such time as any judgment was paid, and thereafter requiring proof of responsibility prior to the issue of license. The new program superseded this by establishing the compensation principle in providing for a direct line of responsibility in the event of an automobile accident, without reference to the question of liability.

The Law — 1955

From 1946 to 1955 the act was amended in a number of respects, all generally in the direction of liberalization or extension of benefits. Because there was no change in principle, the following summary will be based on the 1955 provisions as summarized by the Government Insurance Office in its Annual Report, with some references to earlier provisions. In effect, the act provides:[17]

> "Every person is hereby insured in the amounts hereafter specified against loss resulting from bodily injuries sustained by him directly . . . through accidental means, excluding suicide while sane or insane . . . provided that such injuries are suffered as a result of (a) driving, riding in or on, or operating a motor vehicle, . . . in Saskatchewan, or (b) collision with or being struck, run down or run over by a moving motor vehicle in Saskatchewan. This same coverage is extended to Saskatchewan residents while riding in Saskatchewan licensed vehicles on all highways on the North American Continent.
>
> "It is interesting to note that the original act provided solely for compensation for personal injury, without regard to fault. Since that time the Automobile Insurance Act has been extended to provide other coverages. For example, the collision coverage was added in 1947. Public liability was added in 1948 and fire and theft in 1949. In 1951 a comprehensive coverage was substituted for collision, fire and theft and to extend the coverage to a number of other miscellaneous items. Thus, the Saskatchewan Act now covers all losses due to automobile accidents subject to certain limitations.
>
> "The coverages provided benefits in 1955 for Saskatchewan residents while riding in Saskatchewan licensed vehicles as follows: (1) Personal injury coverage:
>
> "Death Benefits — Where death caused by a motor accident occurs within 90 days of the accident (or within 120 weeks of total continuous disability following the accident) benefits are payable as follows:
>
> For the primary dependent.....$5,000
> For each secondary dependent 1,000
> Up to a total of $10,000 for one death

[16] Ibid., p. 89.

[17] The Saskatchewan Automobile Accident Insurance Act: An Explanation, Public Relations Department, The Saskatchewan Government Insurance Office, Revised February 1956, pp. 4-6.

Since 1955 further amendments have been incorporated into the act. For example, the limit for property damage liability has now been increased to $5000, and the $200 deductible on property damage liability has been completely removed. This Spring (1960) legislation was introduced and adopted to increase the Supplementary Allowance to $2000 and funeral expenses to $250.

If the victim is a married woman and none of the above benefits are payable, $2,000 is payable to her husband.

When children aged one year and over are killed payments are made to the parent who was providing for them as follows:

1 to 6 years	$100
7 years	200
8 years	300
9 years	400
10 years	500
11 years	600
12 years	700
13 years	800
14 years	900
15, 16 and 17	$1,000

"Funeral Expenses — The sum of $175 is payable in lieu of funeral expenses in all motor accident deaths covered by this section, including the deaths of children under one year of age.

"**Dismemberment Benefits** — If dismemberment caused or made necessary by an accident occurs within 90 days of the accident, up to $4,000 is payable. The maximum amounts payable for dismemberment are specified in the Act and range from $500 for loss of a thumb, to $4,000 for loss of both hands or both feet or both eyes. The $4,000 is also payable where the accident results within 90 days of permanent mental or bodily disability preventing the carrying on of any gainful occupation.

"**Supplementary Allowance** — Varying sums up to $600 are payable to injured persons requiring the attendance of a doctor. These payments are known as supplementary allowances and pay for such things as Doctor bills, Hospital bills, X-rays, ambulance service, etc.

"**Weekly Indemnity** — The aim of the weekly indemnity is to maintain an injured person's income up to $25 a week. Naturally, the amount of indemnity necessary to do this varies from case to case. No indemnity is payable during the first week after the accident, but in case of partial disability it may be paid for 52 consecutive weeks thereafter. For total disability, payments may continue beyond 52 weeks until they total $3,000. Married women not engaged in a gainful occupation may receive $20 per week for as long as six consecutive weeks, if they are totally disabled. This is to assist in the hiring of any domestic help needed.

"Public Liability Coverage — The personal injury benefits are not intended to supplant public liability, and Saskatchewan residents can and do claim under public liability without prejudice to their claims under the personal injury section, although the amount of benefits paid under the personal injury section are deducted from any public liability award. In addition, Saskatchewan motorists need public liability insurance outside the Province. The present (1954) limits to which all Saskatchewan motorists are insured under AAIA are $10,000 for one person and $20,000 for more than one person injured or killed in an accident. AAIA insurance also covers the Saskatchewan motorist against property damage claims up to $2,000 without deductible outside Saskatchewan and with $200 deductible in Saskatchewan.[18]

"Comprehensive Coverage—Saskatchewan motorists are provided by AAIA with comprehensive insurance against direct and accidental loss or damage to the insured vehicle and its equipment with a $200 deductible for private passenger cars. The deductible varies for other vehicles. Comprehensive coverages include collision, upset, fire, theft, flood, hail, riot and falling aircraft."

In addition to the license insurance, the Saskatchewan Government Insurance Office also provides a package policy, as noted above. This coverage provides a number of additional benefits which are described in the footnotes below.[19]

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[18] In 1955 the law was not changed in these respects.

[19] Saskatchewan Automobile Accident Insurance Act: **An Explanation, Loc. cit.**

"For an extra premium the Saskatchewan motorist can purchase a Package Policy which increases his coverage to the following:

"Third party liability coverage to limits of $60,000 and $120,000 for bodily injury and $7,000 for property damage. (The $200 deductible on property damage claims in Saskatchewan is also eliminated.)

"Reduce the $200 on collision, upset and plate glass to $50. Eliminates the $200 deductible on all other comprehensive coverages."

"A $25 deductible policy is also available to owners of private passenger cars and farm trucks.

"It should be noted that the Package Policy is an optional purchase and that other insurance companies sell this coverage in competition with the Saskatchewan Government Insurance Office."

The rate structure for the basic coverage as provided in 1955 for the passenger vehicles was:

1936 and earlier	All models	$ 5.00
1937 - 1945	All models	8.00
1946 - 1948	Light models[20]	8.00
	All others	15.00
1949 - 1952	Light models	15.00
	All others	20.00
1953 and later	Light models	20.00
	Medium models	25.00
	Heavy models	30.00

The administration of the entire program is carried out by the Saskatchewan Government Insurance Office, a crown corporation doing a voluntary insurance business in the Province of Saskatchewan. It is aptly described in a publication entitled, **The Saskatchewan Automobile Insurance Act: An Explanation,** prepared by the Public Relations Department of the Saskatchewan Government Insurance Office, Regina, Saskatchewan, in February 1956. This publication notes as follows:

> "The Saskatchewan Government Insurance Office employs a large staff of its own adjusters and, in addition, engages the services of independent adjusters. In order to keep down adjustment costs, the Saskatchewan Government Insurance Office has set up Claims Service Centres in the major provincial centres. Damaged vehicles are driven or towed into the Service Centres where estimators set a price on the repair job and adjusters look after any claims. This saves travelling time and expense for adjusters, estimators and the public and enables the Office to estimate on the vehicle before it is taken to a garage for repair. Claimants can take the vehicle for repair to the garage of their choice. Of course, it would not be economical to bring all vehicles from every area into Service Centres and staff and independent adjusters deal with these cars. The Office has a Salvage Centre to which it sends total wrecks. At the Salvage Centre, the vehicles are broken up and a flourishing business is done in spare parts.
>
> "Administration costs for AAIA including collection costs, office administration, publicity and adjusting costs but excluding commissions amounted to 13 cents for every dollar of premium income in 1954. The average expense ratio for other Canadian companies for collection costs, office administration, and publicity but excluding commissions and **adjustment costs** (a heavy item) amounted to 19 cents for every dollar of premium income. It will be seen that AAIA administration is efficient and economic."

The financial experience of the Saskatchewan Government Insurance Office with Automobile Accident Insurance Program is summarized in Table 54. It is evident that in four of the nine years between 1946 and 1955 the program produced a surplus, that is had revenues in excess of expenses and losses incurred. In five years, deficits of amounts ranging from $86.6 thousand to $1.6 million were incurred. In only three of these years, however, was the program actually operating with a net total negative surplus.

The Government Insurance Office, by law, is charged with operating the program so that there will be no element of subsidy from the taxpayers.

Thus, separate accounts for this business are maintained and the annual surplus or deficit is carried forward. Between 1951 and 1955 premiums were increased and some coverages were broadened sharply. The one major reduction in coverage was dropping the deductible from $100 to $200 for property damage. Noting the distribution of property losses, by amount, both in New Jersey and Saskatchewan, this change could not help but have a drastic effect upon costs, sharply reducing outlays. As a result, in 1954 and 1955 (both calendar and license years) the fund showed a surplus. Subsequently, rates were reduced for both the 1955-56 and 1956-57 license years, to reduce the accumulated surplus. Herein is a substantial difference from commercial insurance practices where annual earned premiums are computed and reserves established and carried forward, without reference to surplus. In any case, the program was obviously solvent in 1955 with the then applicable rate structure and experience. (See Table 54.)

[20]Light models mean those with wheel bases less than 100"; heavy models, those with wheel bases greater than 123".

1955 Experience

Although data are not strictly comparable, it may be interesting to observe certain minimal data concerning the Saskatchewan universe in combination with the financial data. (See Table 55.)

Comparatively, the data for Saskatchewan show a significantly lower proportion of vehicular accidents (63.92 percent) than New Jersey (80.77 percent). Similarly, the proportion of "other" accidents in Saskatchewan (33.28 percent) is significantly higher than in New Jersey (14.8 percent). The proportion of pedestrian accidents is about twice as great in New Jersey (4.42 percent) as in Saskatchewan (2.8 percent).

These differences may be explained in several ways. First, Saskatchewan is a rural province having little of the urban congestion typical of New Jersey. The proportion of vehicles involved in accidents therefore may be expected to be smaller. Similarly the proportion of pedestrian incidents might be expected to be smaller, for the same reason, while the number of "overturn," "ran off the roadway," "fixed object," and other single vehicle incidents could be expected to be larger. Despite the fact that the ratio of accidents to vehicles is lower for Saskatchewan, it is undoubtedly true that the reports for that Province come much closer to the universe of accidents than do those of the Bureau of Traffic Safety in New Jersey. Since the Province is the insurance carrier in all cases, and since all damage is covered without regard to fault, it may be expected that reports of incidents will approach the actual total. Although the deductible of $200, which is well known and which is applicable to both vehicles in a collision may serve as some deterrent to reporting, a substantial proportion of the motorists also have the package policy which has lower limits.

As would be expected, the distribution of injury and property damage costs by accident type in these two universes also differs. The proportion of bodily injury in New Jersey is higher than in Saskatchewan, although this is somewhat misleading in that a higher proportion of the bodily injuries appear to be more serious in Saskatchewan than New Jersey. The one exception notable is in pedestrian incidents where the proportion injured in New Jersey (74.73 percent) is below that in Saskatchewan (98.42 percent).

Data for 1955 losses are shown in Table 56. Altogether, in Saskatchewan there were 3,079 incidents producing bodily injury (and presumably property damage in all but pedestrian cases) during the calendar year. Of this total 91 involved one or more fatalities, 101 being killed. Some 2,081 received supplementary allowances, i.e. medical care — including all medical costs except hospital charges which are nominal since hospitalization is also provided by the government — of which 804 were both breadwinners and injured seriously enough to require weekly indemnity for some period of weeks. Only two lost limbs. Total losses incurred for bodily injury on these accounts amounted to $619,483.74, or an average of $201.20 per victim, including death claims. Per registered vehicle the incurred loss was $2.18 for the year on account of bodily injury.

Losses paid were somewhat different, as would be expected, since there is an element of time difference between the two items, the first being losses incurred, including reserves, the second being actual payments made during the year, regardless of when the loss was incurred. It must be noted that the incurred data do not always result in equal payments because of adjustments to actual losses. In 1955 actual payments amounted to $580,402.19 for the year.

Table 57 summarizes property damage losses. Altogether there were 6,310 claims, of which 5,096 related to collisions. Another 670 were for property damage other than to vehicles. Out of the total only 245 were filed as liability claims. Some 251 fire losses and 48

theft claims were filed under the comprehensive coverage. Total claims were for $2,005,913, of which $1,371,375 were for collision damages. Other property damage accounted for only $127,182 and liability claims $298,905. Average loss per claim, thus, was $318, and per registered vehicle a little over $7.00.[21]

Table 58 summarizes and compares the results for both New Jersey and Saskatchewan. Clearly, the Saskatchewan data represent something different as to coverage or as to type of experience, or both. Aside from the obvious difference in size of the universes, one must note certain other similarities and differences.

First, the number injured per accident is slightly higher in Saskatchewan, as might be expected in a rural setting where a larger proportion of the accidents are highway (high speed) accidents. However, the number of injured per registered vehicle is much higher in New Jersey than in Saskatchewan, again a function of accident frequency. When damages are compared, it is evident that New Jersey ($476.36) costs are considerably greater than those in Saskatchewan ($297.86) on a per accident base. The per registered vehicle costs are more than ten times larger in New Jersey ($23.46) than in Saskatchewan ($2.19). Part of this is a function of frequency, of course, but a part of it, probably a fourth or more, is due to the inclusion of hospital costs in New Jersey at commercial cost rates, and their exclusion, except nominally, in Saskatchewan. The most important element is frequency, Saskatchewan injury severity being greater on the average than New Jersey's.

Second, while approximately the same proportion of vehicles is involved in accidents in both universes, the number of damaged vehicles per registered vehicle is four times as large in New Jersey (0.088) as in Saskatchewan (0.021). Frequency, thus, is greater in New Jersey than in Saskatchewan, as would be expected in the two different kinds of situations. When costs are compared, however, the data show New Jersey to have property damage costs of $463.08 per accident while Saskatchewan reported only $298.59. Saskatchewan data were universally subject to a $200 deductible, except where a liability settlement took place. Since less than 15 percent of all claims, by amount, were on a liability base, the figure shown understated the actual loss by over $160 per registered vehicle. On this basis, the severity would appear to be similar. The average cost per registered vehicle, however, was $40.91 in New Jersey and only $6.37 in Saskatchewan (after deductible). Even after adjusting for the deductible, the difference would be more than twice the Saskatchewan cost. Frequency, thus, is the principal difference.

One other item may be noted. The average age of vehicles in Saskatchewan is probably greater than in New Jersey, which would tend to lower costs slightly for Saskatchewan. The striking thing about the comparison, however, is the great similarity of costs as between these universes on a per accident base. With adjustments for frequency and differences in coverage and exposure, the Saskatchewan data, if used for New Jersey, would appear to produce similar results. Because of these differences, however, it is both easier and more valid to use a compensation hypotheses based upon the same universe without adjustment. Accordingly, the Saskatchewan data will not be used basically in estimating costs of a compensation program for New Jersey. They may be used as a basis for indicating that the system is workable and is producing results satisfactory from a physical and financial viewpoint in a large universe, however.

[21]This figure is based on the universe of all vehicles, commercial and private. A similar procedure was also used in New Jersey and Massachusetts, although in each of these cases it is recognized that rate structures are differentiated as between these types on the basis of exposure and experience.

TABLE 56
Losses Incurred and Losses Paid on Account of Bodily Injury
in Saskatchewan during Calendar, 1955[1]

Type of Claim	Number of Claims	Amount of Claim	Average
Incurred			
Supplementary Allowance	2,081	$179,988	$ .86
Weekly Indemnity	804	128,422	160
Dismemberment	2	6,700	3,350
Death	91	286,698	3,151
Funeral Expense	101	17,675	175
Total (Ex Death Benefits)	2,887	315,111	109
Total	3,079	619,484	201
Paid			
Supplementary Allowance	1,852	150,601	81
Weekly Indemnity	553	133,801	242
Dismemberment	10	26,700	2,670
Death	83	252,998[1]	3,048
Funeral Expense	95	16,302	172
Total (Ex Death Benefits)	2,415	311,102	129
Total	2,593	580,402	224

Source: The Saskatchewan Government Insurance Office.

[1]To illustrate the distribution of death benefits, 36 primary dependents received $167,500; 44 secondary dependents received $39,000; 16 parents (for children) received $5,498; one receiving support from a deceased, $2,000; 10 husbands (for wives) $20,000; 20 parents (for children over 18) $19,000.

TABLE 57
Losses Incurred on Account of
Property Damage in Calendar 1955 Accidents
Saskatchewan, Canada

Type of Claim	Number of Claims	Amount of Claim	Average
Public Liability	245	$ 298,905	$1,220.02
Property Damage	670	127,182	189.82
Collision	5,096	1,371,735	269.18
Fire	251	193,661	771.56
Theft	48	14,430	300.63
Total	6,310	2,005,913	317.89

Source: Saskatchewan Government Insurance Office.

TABLE 58
Comparison of Estimated New Jersey and Saskatchewan
Automobile Accident Experience, 1955

	New Jersey Adjusted Victim Sample[1]	Saskatchewan
Total Vehicles Registered	2,001,076	282,238
Number of Accidents	98,533	3,495
Number of Vehicles in Accidents	187,533	
Bodily Injury		
Number Reported (Claims)	49,881	2,081
Per Accident	0.51	0.595
Per Registered Vehicle	0.025	0.0073
Amount of Claims	$46,957,966	$619,484
Per Accident	$ 476.36	$ 297.86
Per Registered Vehicle	$ 23.46	2.19
Number of Fatalities	723	101
Per Registered Vehicle	0.00036	0.00035
Property Damage		
Number Reported (Claims)	176,807[2]	6,021[3]
Per Accident	1.79	1.72
Per Registered Vehicle	0.088	0.021
Amount of Claim	$81,875,206[2]	$1,797,822[3]
Vehicle	$62,349,423[2]	$1,670,640[3]
Other	$19,525,423[2]	$ 127,182
Per Accident	$ 463.08	$ 298.59
Per Registered Vehicle	$ 40.91	$ 6.37

[1]All data are based on the adjusted traffic Safety Bureau totals and Victim Samplé results. These data produced the lowest costs among the hypotheses tested.
[2]Exclusive of all comprehensive, fire and theft coverages.
[3]Exclusive of fire and theft.

CHAPTER V

Summary of Insurance Cost Conclusions

THE purpose of this study is to explore the financial results of automobile accidents under various types of insurance conditions with a view to establishing a factual basis for comparing results and costs. As was noted earlier, the basic hypotheses to be compared are: (1) The present system, as represented by the 1955 New Jersey automobile accident universe with voluntary liability and direct insurance under a financial responsibility statute and with an unsatisfied judgment fund; (2) A system of compulsory liability insurance, hypotheses to be based upon 1955 experience in Massachusetts, but illustrated by use of New Jersey 1955 accident data and experience; (3) A system of compulsory compensation insurance — for both bodily injury and property damage — also to be illustrated by 1955 New Jersey accident and experience, based upon two hypotheses (a) assuming the Workmen's Compensation coverage in New Jersey in 1955 as applicable to automobile accidents, and, (b) assuming a total coverage, as in Saskatchewan, but using New Jersey frequency and severity rates and experience in preparing the cost model.

In the preceding chapters the raw materials with which these comparisons may be made have been developed and set forth. In this chapter the data are drawn together and compared. Certain refinements not developed earlier are also introduced to complete the cost comparisons. In introducing these data it must be emphasized that these are cost figures. They cannot be compared with gross insurance premiums which include administrative loading and sales costs. They are comparable to the pure premium. In this sense, all of the data following, except that for the present system, have to be adjusted upward to allow for the difference between pure and gross premium costs, if the **total insurance costs** of accomplishing accident coverage along these lines are to be considered.

To begin with, one may note that auto accidents in New Jersey in 1955 resulted in total losses of $129.3 million. Of this amount some $92.3 million was recovered in insured settlements, leaving an out-of-pocket loss of about $36.0 million. To obtain these insurance recoveries, premiums of 176.6 million were paid in 1955. Net insurance costs (premiums less recoveries) in that year, thus, were $84.3 million. Total losses plus net insurance costs in 1955, amounted to $213.6 million. This, when divided by the number of vehicles, gives an average per vehicle cost of $106.74. This does not indicate the distribution of the actual losses, for nearly 40 percent of those damaged got less than their total losses. This was true despite the fact that many of these were themselves insured. This is not to criticize the present system of insurance for failure to pay, for under it recoveries from liability coverages depend upon a finding of fault or negligence; it is to indicate that an average loss does not portray the actual burden borne by any specific vehicle owners or victims.[1]

Some analysis of these data may be worthwhile as a basis for comparison with other cost assumptions. For this purpose, costs for bodily injury and property damage are considered separately and then recombined to illustrate the cost results.

BODILY INJURY COSTS

Victim Sample

After analysis and adjustment of the Traffic Bureau victim sample results for

[1]For a detailed description of these data, see pp. 39-40.

comparability with the New Jersey universe, it was found that total bodily injury costs averaged $23.46 per registered vehicle. (See Table 59.) This amount is the equivalent of the pure premium which would have been required to pay **all** bodily injury losses at the loss cost given by sample respondents, if the sample results may be taken as representative of the universe.

This amount, if paid into a fund for distribution as losses occurred, would have paid all bodily injury loss costs as reported by the sample of victims, including medical expenses, hospital costs, wage losses, and other incidental expenses resulting directly from bodily injury, either directly to the driver or owner and to all passengers and pedestrians injured. Under the present system (1955) some of these losses were paid by settlement of claims under public liability insurance, some by the medical payments coverage, others by Blue Cross-Blue Shield, and/or other direct accident coverages and some were not recovered at all. (See Table 59.) This is the average loss per registered vehicle on account of bodily injury.

It may be noted that, had all persons been insured for liability, the settlements paid under the bodily injury coverage, including medical payments, would have been $8.66. In other words, according to the victim sample reports of settlements, an average of $8.66 per registered vehicle would have produced an amount equal to the proportion of the losses now paid from this source.

Insurance Company Claims Sample

Because the response to the victim sample survey was thought to be too small to permit valid conclusions in some areas, it was decided to utilize a sample of insurance claims data as a means of checking the results. For this purpose, eight of the 12 largest insurance companies,[2] as measured by public liability-bodily injury insurance premium volume in 1955, prepared detailed analyses of total claims filed for the first week in May, 1955, together with all payments made on account of fatalities reported during the first quarter of 1955. Analysis of these data, after adjustment for comparability with the universe of all New Jersey accidents, shows an average loss cost per registered vehicle of $21.73, when the arithmetic mean, $872 for the company sample, is applied against the universe adjusted to victim sample results. In other words, if the insurance company sample is representative of the losses sustained by the universe, the cost of bodily injury losses per registered vehicle would have averaged $21.73 per registered vehicle. (See Table 60.) These, of course, represent settlements rather than reported costs. Generally settlements are lower than reported costs. However, payments for pain and suffering, which are not included as losses in the victim sample except where recovered, would partially offset this difference. On the basis of this examination of two universes, it appears that reports of losses submitted by the victim sample are reasonably valid.

One significant difference between the company and victim samples is evident in the proportion of accidents to the vehicle universe. Because of this, the proportions injured and the proportion of the injured on which settlements were paid both should be increased over those reported in the Traffic Bureau sample if the data are to be realistic. Such adjustment would increase the per registered vehicle cost to $29.97 if the company sample ratio is used. This difference in reported experience suggests that where insurance is known to exist, claims are more frequently filed. Thus, loss costs would be higher than the victim

[2]Eight participated in full, two others cooperated in part.

TABLE 59
Bodily Injury Losses and Recoveries
as Reported by the 1955 New Jersey Accident Victim Sample

Source of Recovery	Percent of Total Loss	Nonfatal Bodily Injury	Nonfatal and Fatal
Other party's insurer	32.42	$ 5.83	$ 7.60
Victim's insurer (includes medical payments and collision)	37.07	6.67	8.70
Other party personally	7.08	.52	.68
Other direct insurance coverages including Blue Cross, etc.	3.21	.58	.75
Not recovered (i.e. paid personally or lost)	24.42	4.39	5.73[1]
Total	100.00	$17.99	$23.46[2,3]

[1] Of this amount $1.34 would not be a demonstrable cash cost, but rather represents payment for pain and suffering. In fact, this amount should not be counted as a recovery against loss unless the loss is adjusted to include this item. In other words in some cases recoveries exceeded out-of-pocket losses. Overall, this type of recovery amounted to 5.7 percent of the total recovery. For the purpose of this study, losses were adjusted to include this amount since the data were, in many cases, inadequate to define the actual distribution.
[2] The total includes $5.47 on account of fatalities. This was not necessarily paid in all cases. Rather this is what would have been if all fatalities were covered by insurance and the experience of the insured sample were representative.
[3] This amount may be distributed functionally per registered vehicle as follows: Medical expense, $5.80; wage losses, $4.40; other losses, $4.45; loss on account of dependents injuries, $3.34; fatal injuries, (estimated on the basis of average settlements paid for fatal cases, including funeral expenses, by the Company Claims Sample) $5.47.

TABLE 60
Summary of Costs of New Jersey Automobile Accidents Per Registered Vehicle, 1955
as Computed Under Various Assumptions

Assumption	Estimated Cost Per Registered Vehicle		
1955 Victim Sample Based on Adjusted Universe	Bodily Injury[1]	Property Damage[2]	Total
Actual Costs Reported by Victims	$23.46[1]	$41.15	$64.61
Adjusted to $50 deductible collision insurance	23.46	36.92[3]	60.38
Actual Costs Estimated from Company Sample Costs			
a. Liability only	21.73[4]	17.22[4]	38.95
b. With $50 deductible on all cars per Underwriters' Report (add $17.90)	21.73	35.12[5]	56.85
Estimated from Massachusetts Experience			
a. Ratio of accidents to vehicles for Massachusetts, New Jersey Costs (bodily injury) (Underwriters' Ratio, $50 deductible, for Property Damage)	37.55[6]	64.21[7]	101.76
b. Massachusetts ratio and costs to New Jersey numbers	20.50[8]	64.21	84.71
Estimated from New Jersey Workmens' Compensation Experience			
a. Workmen's Compensation bodily injury costs (Victim sample, $50 deductible,	27.84	36.92	64.76
b. Workmen's Compensation with victim sample medical costs, $50 deductible,	29.97	36.92	66.89
c. Workmen's Compensation with bodily injury costs adjusted to Massachusetts ratio and property damage adjusted to New Jersey company sample property damage ratio	44.54	64.21	108.75
d. Workmen's Compensation with victim sample medical costs and Massachusetts and company sample ratios	47.95	64.21	112.16
Saskatchewan Costs			
a. Actual ($200 deductible for collision)	8.37	22.43	30.80
b. Adjusted to Massachusetts and company ratio	13.40	39.03	52.43

[1] Assumes that victims would receive settlement in proportion to those reported by victims in sample but adjusted for insurance on all vehicles. If all had been insured, the amount would have been $8.66.
[2] If all vehicles had carried liability insurance and all claims were settled as reported by the victims the pure premium cost would have been an average of $17.21 per registered vehicle.
[3] The $36.92 assumes $50 deductible collision insurance on all cars. If cost to insurance is computed on the same basis as the above bodily injury costs, the average would be $20.35. (36.14 percent of victims collected from collision insurance. 58.71 percent of primaries had collision insurance and 61.56 percent of potential claimants collected. This would yield $20.35 if all vehicles had collision insurance.) However, some of those with collision insurance would have received settlement under liability insurance. The comparable value for costs to insurance companies would be $20.35 plus $17.21 or a total of $37.56.
[4] If it may be assumed that all claims for bodily injury under liability were settled as reported by the victims, the pure premium per registered vehicle for settlements would have been $10.08. In the same way, if all property damage liability claims were settled as reported by victims, the pure premium per registered vehicle would have been $10.37.
[5] If the same assumptions as in 4, above, are made, the pure premium required including collision would have been $28.89.
[6] Under the assumptions noted, if settlements were in proportion to total as reported by the company sample, the pure premium required for liability would have been $17.42.
[7] Under the assumption noted in 3 above, the pure premium would have been $43.09.
[8] Under the assumption of settlements to losses reported in New Jersey, the pure premium costs would have been $9.51.

sample indicates because of accidents and injuries not in fact reported.[3]

As was noted above, not all claims were paid under the liability coverage. If it is assumed that settlements were made in the sample proportion as reported by the company sample, and that there were insurance in all cases, the pure premiums required to meet this proportion of the loss would have been $10.08.

Actual Pure Premiums Reported for Insured Bodily Injury Liability Losses, 1955

The Underwriters' Association reports a pure premium cost for bodily injury, including medical payments, for New Jersey for 1955-1956 (fiscal year) of $18.04 per insured vehicle. If it may be assumed that a similar premium had been charged all New Jersey registered vehicles, approximately 77 percent of the present bodily injury accident costs, as reported by the New Jersey sample of victims would have been met, leaving an average of 23 percent of the costs to be borne by the victims. Oddly enough, the sample data show victims bearing 24.42 percent of the costs in 1955. However, recoveries include payments by the other party personally, Blue Cross, etc., as well as the liability and medical payments coverages.

PROPERTY DAMAGE LOSSES

Victim Sample

Similar analyses were then prepared for losses due to property damage. Total losses, without reference to the types of insurance coverage required, as reported by the New Jersey Traffic Bureau victim sample averaged $41.15 per registered vehicle.[4] (See Table 61.) On the basis of the ratio of reported liability settlements to total costs, if it were also assumed that all cars were insured, the pure premium cost of 100 percent liability coverage for property losses would have been $17.21. This would have provided for recoveries under insured property damage liability in the proportion reported by victims.

If the data concerning the property damage losses by the insurance company sample are representative (it will be remembered that they were substantially lower per case, but more frequent than for the victim sample), losses claimed under the public liability-property damage coverage, after adjustment for comparability with the state universe, per registered vehicle would have amounted to $17.22. This figure, like the above, excludes the costs of collision settlements.

If these figures were adjusted to reflect settlements in proportion to total costs as reported by the companies, the pure premium required would have been $10.37 for property damage liability. If collision with $50.00 deductible were added to the property coverage, the pure premium would have been approximately $28.27.

To make this figure comparable to that reported by the victim sample, that is to reflect all property losses, collision claims would also have to be included. If it may be assumed that all collision coverage were subject to a $50 deductible, the adjusted Underwriters' Association pure premium for 1955 for collision coverages would have been $17.90. Combining these two rates produces a total pure premium based on property damage-liability and collision, all property dam-

[3] If the Massachusetts ratios of accidents to vehicles and injuries to accidents are used, costs of bodily injury (assuming New Jersey victim actual costs) would total $37.55 per registered vehicle. This would seem unrealistic for at least two reasons: (1) In Massachusetts property damage liability insurance is not required—therefore, bodily injury claims tend to be inflated for "pain and suffering" to help meet such losses; and (2) frequencies tend to be higher than actual in an effort to establish a basis for property damage recovery. See pp. 41 ff. and 49 ff.

[4] This figure includes all property damage losses both to vehicles and to other property reported by victims of the sample of accidents selected from the Traffic Safety Bureau records for study, adjusted for comparability with the state universe. It includes all items of loss whether or not they were recovered from insurance or other sources, or not recovered at all. See pages 37-39.

age losses, of $35.12.[5] That these results are limited in terms of the number of accidents reported as compared with the actual number occurring and giving rise to claims is apparent. The different types of assumptions which may be made to cover this limitation are detailed in the following sections.

SUMMARY OF LOSS COSTS

(Pure Premiums)

Had all losses been insured directly and settled at cost, the apparent per registered vehicle cost for bodily injury and property damage (pure premium) would have been:

A. **Victim sample:**
   1. For bodily injury $23.46
   2. For property damage, all types 41.15
   3. Total 64.61

B. **Company sample experience (unadjusted for accident ratio difference)**
   1. For bodily injury $21.73
   2. For property damage, all types, subject to $50 deductible for collision 35.12
   3. Total ..... 56.85[6]

C. **Company sample (adjusted for higher accident ratios)**
   1. Bodily injury $29.95
   2. For property damage, all types, subject to $50 deductible for collision 59.70
   3. Total ..... 89.65[6]

D. **Underwriters' pure premium rates (actual—adjusted to victim sample)**
   1. For bodily injury $18.04
   2. For property damage-liability, collision and comprehensive, all causes subject to an adjusted $50 deductible 30.57
   3. Total 48.61

[5]Actual pure premiums as reported by the Underwriters' Association and Bureau for property damage liability insurance for New Jersey for 1955 were $12.67 per insured vehicle. The difference between the average rate, as reported for the company sample, and the pure premium can only be explained in terms of particular differences occurring within the week sampled by the companies and the difference in the proportions of claims filed to total where insurance is known to exist. It may be noted that the Traffic Safety Bureau victim sample figure includes all damages reported, regardless of recovery.

[6]It will be noted that this property damage estimate includes collision losses estimated on the basis of the Rate Bureau report, not the company sample from which data were not available for this coverage.

TABLE 61

Property Damage Losses and Source of Recovery per Registered Vehicle, as Reported by the Sample of Victims of 1955 New Jersey Automobile Accidents

Source of Recovery	Percent of Total Loss	Amount
Other party's insurer	36.7	$15.10
Collision insurance	29.1	11.97
Other party personally	4.4	1.81
Not recovered	29.8	12.27
Total	100.0	$41.15[1]

[1]It will be noted that public liability insurance settlements, as reported by the sample of victims were higher than the pure premium rates reported for New Jersey by $2.43, while the collision pure premium rate based on costs reported by victims were $0.70 under the adjusted pure premium reported for the state.

TABLE 62

Estimated Pure Premiums for Automobile Accident Insurance in New Jersey, 1955, Assuming Compulsory Liability Insurance were Required

Victim Sample	(A) First Assumption	(B) Second Assumption
Bodily injury	$ 37.55	$20.50
Property damage, all types, $50 deductible for collision	64.21[1,2]	64.21[1,2]
Pure Premium (Total)	$101.76	$84.71

[1]Since compulsory liability insurance does not extend to property the Massachusetts ratio and New Jersey cost data have been used in both cases. If it can be assumed that the property damage is overstated by victims in about the same proportion as Bodily injury the amount for property damage under this second assumption would be $35.67 and the total, $56.17. It may be noted that this figure is reasonably close to the Underwriters' pure premium for New Jersey.

[2]If the deductible were $100 the pure premium would be 57.69; if it were $200, 47.17, on basis of the assumption used.

It must be noted that the last estimates (D) would have covered only 77 percent of all bodily injury costs and 74.3 percent of all property losses as reported by the victim sample. Since this excludes 20.9 percent of the bodily injury losses and 25.7 percent of the property damage losses which were not recovered, there is an apparently reasonably close relationship between the estimates of New Jersey costs based on victim reports and the Underwriters' pure premium reports. However, the final estimate so produced is considerably lower than it would have been, were the data adjusted to reflect the actual ratio of accidents to total vehicles and injuries to accidents as represented by the company (and Massachusetts) data.

COMPULSORY LIABILITY INSURANCE — MASSACHUSETTS BASE

Bodily Injury Losses

Data were collected for bodily injury losses in Massachusetts as a means of determining what effects, if any, compulsory liability insurance might be expected to have on New Jersey accident reports and losses. The data show that the ratio of bodily injury claims to the number of vehicles registered is considerably higher in Massachusetts than was true for New Jersey. They also show, however, that the **average claim paid** in Massachusetts was considerably below the **average loss reported** by New Jersey accident victims.

First, if it is assumed that: (1) the ratio of bodily injury claims reported for Massachusetts would develop in New Jersey, were compulsory liability insurance for automobile accidents required in New Jersey, and (2) the New Jersey victim expense costs reported were accurate and would become the actual basis for settlement, then bodily injury costs (pure premium) to cover all losses reported in New Jersey on the Traffic Safety Bureau Victim sample basis would amount to $37.55 per registered vehicle.

Second, if it is assumed that: (1) the Massachusetts ratio of claims to vehicles, and (2) the Massachusetts average claim settlement paid would apply to New Jersey data, then the pure premium costs for bodily injury in New Jersey would be $20.50. (See Table 62.)

It appears logical that the number of claims filed both under liability and medical payments would increase if compulsory liability insurance were to be required. Since data for the Massachusetts universe and data for the insurance company sample in New Jersey both indicate a substantially higher ratio of claims to vehicles insured than the 1955 accident victim survey, the assumption that there would be an increase in claims reported is warranted. Whether the proportions for New Jersey, if all vehicles were insured, would be exactly the same as those for Massachusetts, lower or slightly higher, or similar to the insurance company sample experience for New Jersey, is a matter of question.

Comparing claims paid in Massachusetts to expenses claimed and settlements paid for the New Jersey Traffic Safety Bureau file sample and the New Jersey company sample, respectively, suggests that the victims in the New Jersey victim sample generally overstated expenses, or, that companies, on the basis of liability determinations, reduced the amounts paid on the average to something less than the claimed loss. On the basis of these comparisons it appears that the **claim paid figure** for Massachusetts is perhaps more nearly correct or a truer representation of what might be expected under conditions of compulsory liability insurance.

Property Damage Losses

It will be noted that the Massachusetts' provisions for compulsory liability insurance do not extend to property damage. Thus, if it may be assumed that property damage claims under compulsory liability insurance would increase and would be reported in the sample proportion of the Underwriters' report for New Jersey, the costs of property damage as obtained from the sample would understate the actual losses. Applying this assumption to the New Jersey sample data on costs, (the ratio of claims to accidents in the two instances were 1.74 to 1.0) average costs per registered vehicle for property damage (all types, exclusive of what might be classed as comprehensive claims) would amount to $71.58 per registered vehicle for 1955. (See Table 61.)

Combining the bodily injury and property damage losses under the assumption that compulsory liability insurance were required in New Jersey would produce the results shown in Table 62. No estimate of the number of claims not settled is available for Massachusetts. Hence,

it has been assumed that the settlements paid per accident (total) for Massachusetts reflects this. For New Jersey, also, some proportion would not be settled under this coverage. Some possible adjustments to reflect these differences are shown in Table 60. These data (Table 62) understate the total costs by the amount not actually settled.

COMPULSORY COMPENSATION

Bodily Injury Losses— New Jersey Workmen's Compensation Law Basis

Detailed data on New Jersey Workmen's Compensation automobile accident claims were collected and analyzed. Utilizing the results of this experience and assuming that all vehicles in New Jersey were covered under the provisions of the 1955 Workmen's Compensation Law, except that no compensation for wage loss would be paid unless an actual loss existed, total costs for bodily injury, based on the New Jersey Traffic Safety Bureau victim sample experience would be $27.84 per registered vehicle.

If it were assumed that the Massachusetts proportions for bodily injury apply—that is, that the ratio of claims to registered vehicles were in the Massachusetts proportion rather than in the New Jersey sample proportions, the costs would have been $44.54, per registered vehicle. These figures would have covered all medical expenses, wage losses, and death claims. The latter seems more realistic in that both the company sample and the Massachusetts data suggest a higher ratio of accidents to vehicles than the Traffic Safety Bureau sample records do. Whether the actual ratio is in exactly these proportions can only be a matter of judgment; however, it is supported by the company data for New Jersey in this case.

Property Damage Losses

To these data the appropriate property damage figures must be added to obtain total pure premium costs for complete coverage. For example, if the New Jersey victim sample actual cost basis subject to a $50 deductible were used, property damage costs would amount to $36.92. If the Underwriters' ratio of losses to the universe were assumed, together with a $50 deductible, the pure premium for property losses would be $64.21.

Variations in Settlements

The compensation hypothesis above may be varied by assuming the reported New Jersey victim sample medical expense costs in place of actual average Workmen's Compensation medical expense costs. In this event, using New Jersey sample data, the costs for bodily injury would have been $29.97 per registered vehicle. If the Massachusetts bodily injury accident ratio were used together with actual New Jersey sample medical expense data, the cost would have been $47.95 per registered vehicle.

To these figures the same property damage costs noted above must be added to obtain total pure premium costs for an accident compensation coverage in New Jersey. (See Table 60.)

Total costs for compensation insurance in New Jersey in 1955, using these data, would have been: (1) Victim sample base, unadjusted, $64.76; (2) Victim sample adjusted to Massachusetts proportions for bodily injury and underwriters' ratios for property losses, $108.75; (3) Victim sample, using actual reported medical expenses in place of average compensation medical expense, and underwriters' ratios for property losses, $94.18; (4) Same as (3) with bodily injury adjusted to Massachusetts proportions, $112.16; and (5) Workmen's Compensation with victim sample medical costs and property damage, assuming a $50 deductible, $66.89 .

Saskatchewan—Compensation Basis

Detailed data for 1955 for Saskatchewan, where a total compulsory compensation system exists, indicated that neither the accident universe nor the cost data were strictly comparable to those for New Jersey. Nonetheless, it is note-

worthy that when consideration is given to the differences, the results do not appear irreconcilable.[7] Adequate detailed data are not available to permit making accurate adjustments. Accordingly, no attempt has been made to estimate New Jersey costs on a Saskatchewan base, adjusted. The data for Saskatchewan if applied to the New Jersey victim sample reports without adjustment produces an average cost for bodily injury of $8.37 per registered vehicle. If the Massachusetts' proportions of bodily injuries to accidents were used together with Saskatchewan costs, bodily injury costs would have been $13.40 per registered vehicle. If the New Jersey Traffic Safety Bureau sample actual costs per case were substituted in either of the above formulations, costs, of course, would have been the same as those noted under the two previous compensation assumptions.

Property damage data for Saskatchewan, where a $200 deductible was used, if applied to New Jersey, would produce a loss of $22.43 per registered vehicle. If the underwriters' New Jersey ratio of claims to registered vehicles were substituted for the police record sample ratio and the Saskatchewan average claim figure were applied, the property damage cost would have been $39.03 per registered vehicle. (See Table 60.)

CONCLUDING OBSERVATIONS

This study has examined the costs of automobile accidents in 1955 in the State of New Jersey. It has considered a number of possible ways of meeting those costs from an hypothetical cost viewpoint only. No attempt has been made to evaluate the results which would be achieved in broad economic terms or institutionally. Certainly there is considerable need to investigate many questions in these areas before reaching any conclusions.

While the data are not as precise as would have been possible had greater resources been available to the research team, they are sufficiently valid and the results are similar enough from independent viewpoints to permit a generalization: pure premium costs for either a direct or a compensation coverage are sufficiently low by comparison with present costs, which involve considerable out-of-pocket loss over and above insured and other recoveries, to warrant considering either or both of these techniques for possible adoption from this cost-recovery standpoint.

Indeed, examination of the results of the present system for dealing with automobile accidents in New Jersey, as reported in the survey of victims, showed total losses from all causes, including both bodily injury and property damage, to be $129.3 million. If this amount were shared equally among all vehicles, the cost would have been $64.61 per registered vehicle in that year.

Under the present system, insurance recoveries offset these losses in part. In 1955, according to the victim survey, $92.3 million was paid in settlements under the automobile and other related insurance coverages in force in that year. In balance, thus, automobile accidents actually resulted in out-of-pocket losses of $36.0 million in 1955.

Under the present system, to secure insurance coverages, victims paid insurance premiums of $176.6 million. For the purpose of this discussion, the difference between premiums paid and settlements may be considered as the sales and administrative costs required to obtain the coverages. Thus, the net cost of insurance, $84.3 million (the difference between $176.6 million of premiums and $92.3 million of recoveries), may also be considered as a loss cost of automobile accidents. If this were shared equally among all vehicles, it would average $42.13 per registered vehicle.

To summarize, the costs of losses, $64.61 per registered vehicle and net insurance costs, $42.13 per registered vehicle, produced a 1955 total loss or

[7] See pages 61-62.

accident cost of $106.74 per registered vehicle, on the average. This assumes an equal distribution among vehicles, a condition which does not exist. According to the 1955 victim survey, about 88 percent of all vehicles have liability coverages and 58 percent, direct property damage (collision, fire theft, comprehensive) coverages. On the other side, about forty percent of those damaged recovered something less than their losses from insurance companies. Thus, these present insurance costs do not provide equal coverage nor do they provide certain recovery.

Total costs of accidents, including net costs of insurance, as reported by New Jersey victims for 1955, came to $213.6 million. This produced something less than total coverage and provided for less than full recoveries in a considerable proportion of the cases. Costs, obviously, were not equally distributed.

As noted above, the cost data for accidents as reported by victims would presumably reflect the amount lost and, hence, the amount which would be required, on the average, to pay all losses, no matter what system of coverage was used. One may start, then, no matter what alternative costing base is used, with this cost item. Costs of other systems for meeting these losses would also have to start with this same total and would vary from it in different ways for a variety of reasons.

First, one may note that moving from voluntary to compulsory insurance coverages, as required by all of the alternatives discussed herein, would increase costs by the additional net insurance charges required to bring about universal coverage. At the same time, the number of recoveries might also be expected to increase, as a result. This would operate to adjust costs by reducing the amount of the losses not covered.

Second, in changing to a system of compulsory coverage, certain data adjustments may also be required. For example, when Massachusetts and New Jersey experience were compared, it was noted that the ratio of accidents to vehicles and of injuries to accidents both were greater in Massachusetts than in New Jersey. Similarly, when the results of the victim and company experience in New Jersey were compared, the ratios of accidents to vehicles and victims to accidents were greater in company than in the victim reports. This suggests that the existence of insurance produces a higher frequency of accident reports and possibly more complete reporting of injuries per accident (certainly a larger number are reported). At the same time, the average value per claim is sharply reduced, apparently by the inclusion of many smaller claims. Moreover, because the liability system requires establishment of negligence and because in Massachusetts only bodily injury liability is required, many victims may file claims for more than actual losses on the basis of "pain and suffering" in the hope of increasing the settlement amount to cover property and other losses for which a coverage may not have been available.

If one were to assume the worst possible experience combination for bodily injury losses (Massachusetts ratio), and the highest possible expense base (New Jersey reported costs), which combination is illogical for reasons already cited, and for property damage losses, the underwriters' ratio with a $50 deductible for collision, a per registered vehicle cost of accidents of $102 would result.

On the other hand, if the New Jersey adjusted universe is used as the base with the Massachusetts costs and ratios of accidents and injuries to vehicles, the total would come to $84.71. One must note that these amounts do not include adjustments for losses still not recovered. In addition, they do not include the net insurance costs. Moreover, under this system, some would still receive less than out-of-pocket losses. Adoption of a compulsory liability system, then, would increase costs by the additional insurance premiums required to produce 100 percent coverage. Total benefits

would be increased also, but by less than costs since not all claims are paid under a liability system.

A compulsory compensation plan may also be expected to affect costs in various ways, depending upon methods used and accident experience. If one were to use the most costly assumptions, including actual medical costs as reported by victims (in lieu of medical expense averages under workmen's compensation) and the Massachusetts ratios of victims to accidents and accidents to total vehicles, the pure premium costs for bodily injury and property damage losses would total approximately $112 per registered vehicle.

These assumed conditions are illogical and unlikely ever to occur. Although the ratios of claims to vehicles is likely to increase under this type of system, since recovery would follow proof-of-loss, not negligence, an offsetting factor may be found in the fact that the Massachusetts law does not require property damage liability insurance. The data for that state suggest that claimants in some cases, at least, attempt to recover property losses by reporting bodily injury or by inflating bodily injury claims for pain and suffering. Under the system of compensation herein assumed, this would not be necessary, since all would be required to provide both for bodily injury and property damage losses. This also points up the fact that the assumptions made above lead to adjustment of the property loss ratios upward for the same reason, resulting in a double correction, i.e. the ratio of injuries has been inflated by the claimants in an attempt to provide for property damage not otherwise covered, and the property damage coverage has also been adjusted upward in similar proportion to allow for underreporting because of less than total coverage. The end product, the pure premium, thus, appears to overstate actual costs by a considerable amount on these accounts.

If the data above were adjusted to reflect actual New Jersey costs, as reported by victims, but Massachusetts bodily injury ratios and the underwriters' ratios and estimates for property losses, a total cost of $64.76 per registered vehicle would result. However, it may be that these figures understate costs somewhat, by ignoring the effects of having a coverage available in every case. If so, an upward adjustment to net costs might be required. Such, however, would not increase the totals to a level comparable to that suggested above. In fact, the total would likely be between these two, probably much closer to the lower than the higher figure. (See Table 60).

To arrive at total costs, the pure premiums must be adjusted for administrative and sales costs. If the former figure ($112) were assumed and adjusted on the basis of a private system ratio of sales and administrative costs to total costs (40 percent of gross) the total would rise to $187 per registered vehicle.[8] On the other hand, if the Saskatchewan ratio (monopoly state fund) of administrative costs to the total were assumed (13 percent), the total would rise to about $129 per registered vehicle. Both figures are larger than average per vehicle costs under the present system, as calculated herein. However, one must note that the underlying pure premium overstates losses substantially. Even so, under the plan every victim would recover up to schedule limits (actual medical costs, wages up to $30.00 per week, death benefits and all property damage subject to a $50 deductible per case) whereas under the present system 28.6 percent of the accident damages are not recovered and about 40 percent of the victims receive less than their actual losses or nothing at all.

On the other hand, if the lower cost estimate were adjusted for sales and administrative costs (40 percent), it would

[8]Actual sales and administrative charges for Automobile Compensation Insurance might be somewhat lower than these estimates. Workmen's Compensation, for example, shows considerably lower costs on this account.

bring the total to about $108, a figure which is about the same as estimated present costs. If the Saskatchewan net cost of insurance (ratio) were used (13 percent), the total would be about $74 per registered vehicle. It may be emphasized that these figures are also based upon total reporting and recovery of scheduled amounts, at least, in every case. A different distribution of cost and loss results, but the total would be about the same as or a little less than present costs depending upon which type of insurance carrier is selected.

It is quite clear from this analysis that shifting from the present to any of the alternative systems studied will both increase total insurance costs to some extent and radically change the distribution of costs among the driving public and their accident victims. The total costs of insurance would be increased as those not now covered obtained it. Total losses presumably would not be affected if victim reports are correct. Some possible variations and the reasons for them have been noted along with probable changes in costs. Such, however, would not change the actual relationship between costs and losses. The only real difference between assumed and present cost bases may be found in the form of administrative organization adopted. For example, costs will vary considerably between those charged by a State Fund and private carriers, as has been noted above. The distribution of costs would be changed in that the universe of vehicles (owners or operators) would share in the total loss on some basis. From a settlement viewpoint, the compensation plan is desirable in that all losses would be compensated on the same basis (up to schedule limits), regardless of negligence, on proof of loss. Moreover, it would appear to cost no more, perhaps less, than the present system, depending upon whether it were handled by a State Fund or private carriers.

Certainly these data could be made more precise given greater time and resources. As a further financial-actuarial test, similar procedures should be adopted and data developed for another state universe. If the results are similar, there should be little doubt as to the cost outcomes of making a change to any of the techniques discussed.

When, and if, this further study is attempted, it should be extended into evaluative procedures in the economic, social, and political spheres to permit presentation of the whole argument for or against any or all of these techniques. It must be recognized, however, that one's social philosophy may have as much or more to do with establishing the criteria for evaluating the technique finally selected than any documentary arguments, behaviour, or performance, no matter how cogent.

APPENDIX A

Sampling Errors

VALUES throughout the report have been derived from sample counts and proportions. When a sample has been drawn correctly, results are expected to be similar to values and proportions in the universe from which the sample was taken but not exactly the same. Therefore, samples drawn from the same universe (or several universes with equal values) may differ from each other and from the true value in the universe. If the observed differences are larger than those which might be expected according to the laws of probability, the difference is said to be "significant," and the conclusion is reached that the universes from which the samples were drawn have unequal values. The expected differences, called "sampling errors," are computed by using probabilities. The sizes of the errors vary according to the sizes of the samples. In general, the larger the sample, the smaller the sampling error.

Table A shows the approximate errors which should be added to and subtracted from sample percentages to obtain 95 percent confidence limits. These are limits within which the true percentage in the universe from which the sample was drawn is expected to be. For example, if a sample of size 50 yields 20 percent in one category, there is 95 percent confidence that the true percentage in the universe from which the sample was drawn is between 20 percent ± 12 percent or 8 percent to 32 percent. On the other hand, if the sample were size 1,000, the limits would be 20 percent ± 2 percent or 18 percent to 22 percent.

Two sample percentages may be compared for significant differences by comparing the two sets of confidence limits. If the limits overlap, the two samples may have come from the same universe or universes with equal values. If the limits do not overlap, the difference between the sample results is considered "significant," and the decision is made that they were probably drawn from universes with different percentages (or that within the same universe, two sample categories have different universe proportions).

Many of the subsamples in the report are small, and, therefore, the sampling errors are so large that no significant difference will be indicated even though the percentages show wide variations.

Arithmetic means: The difference which may be expected between a sample arithmetic mean and the mean of the universe from which the sample was drawn varies according to the spread of the data (standard deviation) and the size of the sample. There are, therefore, different sampling errors[1] for every arithmetic mean mentioned and for every cost per registered vehicle. If all of these are considered, the sampling error for the bodily injury costs in nonfatal accidents, would indicate that there is approximately 95 percent confidence that the true average per vehicle registered is somewhere between $17.99 ± 4.75 or $13.24 to $22.74. The limits for damage to car would be approximately $31.34 ± $2.65 or $28.69 to $33.99, and for damage to property other than the car would be $9.81 ± 1.35 or $8.46 to $11.16.

---

[1]The errors are derived from combining the various costs and using the formulae:

Standard deviation $= \sqrt{\frac{\Sigma (X - \bar{X})}{N - I}} = S$

Sampling Error $= \frac{2S}{\sqrt{N}}$ for 95 percent confidence limits.

APPENDIX A

Sampling Errors to Obtain 95 Percent Confidence Limits of the True Percentage in the Universe (Percentages)

Percent Observed in Sample	Size of Sample											
	10	15	20	30	50	100	200	300	400	500	1,000	2,000
0	16	11	9	6	4	2	2	1	1	1	0	0
5	--	16	13	11	8	5	4	3	3	3	2	1
10	23	19	15	13	10	7	5	4	4	3	2	1
15	--	19	18	14	11	8	6	5	4	4	2	2
20	27	22	19	16	12	8	7	6	5	4	3	2
25	--	24	20	17	13	9	7	6	5	4	3	2
30	29	25	22	18	13	10	7	6	5	4	3	2
35	--	25	22	18	14	10	7	6	5	4	3	2
40	31	26	23	19	14	10	7	6	5	4	3	2
45	--	26	23	19	14	10	7	6	5	4	3	2
50	31	26	23	19	14	10	7	6	5	4	3	2
55	--	26	23	19	14	10	7	6	5	4	3	2
60	31	26	23	19	14	10	7	6	5	4	3	2
65	--	25	22	18	14	10	7	6	5	4	3	2
70	29	25	22	18	13	10	7	6	5	4	3	2
75	--	24	20	17	13	9	7	6	5	4	3	2
80	27	22	19	16	12	8	7	6	5	4	3	2
85	--	19	18	14	11	8	6	6	4	4	2	2
90	23	19	15	13	10	7	5	5	4	3	2	1
95	--	16	13	11	8	5	4	3	3	3	2	1
100	16	11	9	6	4	2	2	1	1	1	0	0

1. Add error to and deduct from the sample percentage to obtain the 95 percent confidence limits of the true percentage in the universe from which the sample was drawn.

2. Errors were derived from tables on confidence intervals for binomial distributions in V. W. Snedicor, Statistical Methods, 4th edition, The Iowa State College Press, Ames, Iowa, 1946.

APPENDIX B
Questionnaires Used in Surveys

FORM

NEW JERSEY AUTOMOBILE ACCIDENT VICTIM SURVEY

TEMPLE UNIVERSITY BUREAU OF ECONOMIC AND BUSINESS RESEARCH

This questionnaire refers only to accidents which occurred in calendar year 1955. Do not include experience in more recent or earlier accidents.

Do Not Write in These Spaces

1. In what kind of accident were you involved? (Check the right answer)

____a. A two car collision
____b. A collision of more than two cars
____c. A car and a truck
____d. A car and a bus or trolley
____e. A car and a pedestrian
____f. A car and a stationary object
____g. A car and a train
____h. A truck or bus and a train [1] 6____
____i. Other (Indicate kind)
_____

2. In what way were you involved in the accident? (Check the right answer)

____a. As one of the drivers concerned
____b. As a passenger in one of the vehicles [2] 7____
____c. As a pedestrian

3. What was the cause of the accident? _____ [3] 8____

4. If possible, indicate who was at fault, and the extent of his fault.

	At fault		
	Entirely	To Some Extent	
a. The other driver			9____
b. The pedestrian			10____
c. The driver of the vehicle in which you were a passenger.			[4] 11____
d. You, the driver			12____

5. If you carry insurance, check the kind. [5] 13____

____a. Collision—Amount deductible $_____ ____c. Medical Payments 14____
____b. Public Liability and Property Damage ____d. Comprehensive (Fire & Theft) 15____

6. How many were injured or hospitalized as a result of the accident? [6] 16____

____a. Number in your car injured 17____
____b. Number in your car hospitalized 18____
____c. Total number injured as a result of the accident 19____
____d. Total number hospitalized as a result of the accident 20____

7. Describe your injuries briefly. _____ [7] 21____
_____ 22____

8. What were the permanent effects, if any? _____ [8] 23____
_____

9. What financial losses did you suffer because of YOUR OWN INJURIES? 24____

a. Hospital bills $_____ c. Wage losses $_____ [9] 25____
b. Doctor bills $_____ d. Other costs $_____ 26____
e. What were these other losses? _____ 27____
_____

10. What financial losses did you suffer because of YOUR DEPENDENTS' INJURIES? 28____

a. Income losses $_____ c. Doctor bills $_____ 29____
b. Hospital bills $_____ d. Other costs $_____
e. What were these other costs? _____ [10] 30____
_____ 31____
32____
33____
34____
35____

APPENDIX B
Questionnaires Used in Surveys

11. **From what sources did you obtain funds to pay these losses?**
If possible, show the proportions. (Check the right boxes) [11] 36

Sources	Less than ¼	¼-½	½-¾	¾-All	How long did you have to wait for payment? (months)
a. Your own insurer					37
b. Other party's insurer					38
c. Other party, personally					39
d. You, personally					40
e. Cash temporary disability (Unemployment insurance)					41
f. Workmen's Compensation (Your employer)					42
g. Other (See 12 below)					43
					44

12. **If you used your own insurance, under what policy (or coverage) were you paid?**
(Check the right answer)

____a. Life insurance
____b. Medical payments (auto policy)
____c. Blue Cross—Blue Shield [12] 45
____d. Personal accident and health 46

13. **If you used some other source, what was it?**_____ [13] 47

14. **Concerning your claim against the other party or his insurer:** (Check right answer) [14] 48

	Yes	No		Yes	No
a. Did you hire a lawyer?	☐	☐	e. If you sued, did it go to trial?	☐	☐
b. Before settlement was offered?	☐	☐	f. Was it a jury trial?	☐	☐
c. After settlement was offered?	☐	☐	g. Was judgment in your favor?	☐	☐
d. Was it settled without suit?	☐	☐	h. Have you collected it?	☐	☐

49
50

15. **Concerning the settlement of your claim against the other party or his insurer?** [15] 51
(Note the right answer) 52

a. Did you accept the original offer of settlement? Yes____ No____ 53
b. If you did not accept the first offer, why did you decline it?_____ 54
_____ 55
c. How much was the first offer? $_____ 56
d. How much was the final settlement? $_____ 57
e. How was the settlement divided?
1. Property damage $_____ 2. Bodily injury $_____ 3. Medical payments $_____

16. **Are you aware of the provisions of:** (Check the right answer) [16] 58
a. The New Jersey financial responsibility requirements? Yes____ No____ 59
b. The Unsatisfied Judgement Fund? Yes____ No____

17. **Would you be interested in a direct insurance compensation coverage which paid limited benefits for all injuries received and wages lost in vehicular accidents, without regard to the question as to who was at fault, if there were no loss of your right to proceed through the courts as at present?** (Check right answer) [17] 60
61
62
a. Yes____ No____
b. Why?_____

18. **IF YOU WERE A DRIVER OR AN OWNER OF THE VEHICLE INVOLVED IN THE ACCIDENT:** (Note the right answers) [18] 63
64

a. Property damage to your car? $_____
b. Repair costs for your car? $_____
c. Were there other property losses in the accident? Yes____ No____
d. How much were these losses? $_____
e. Did you use your collision insurance? Yes____ No____ 65 66
f. Did you collect from the other party's insurer? Yes____ No____ 67 68
g. Did you collect from the other party, personally? Yes____ No____ 69 70
h. If you did not collect from others, what sources did you use to meet the loss?
_____

APPENDIX B
Questionnaires Used in Surveys

NEW JERSEY AUTOMOBILE ACCIDENT VICTIM SURVEY
Temple University Bureau of Economic and Business Research Form

1955 ACCIDENTS ONLY. DO NOT REPORT EXPERIENCE IN ANY OTHERS.

1. **IN WHAT KIND OF ACCIDENT WERE YOU INVOLVED:** (Check the right answer)
   1. A vehicular collision..... 3. A vehicle and a stationary object.....
   2. A vehicle and a pedestrian..... 4. Other (Indicate kind).....
2. **IN WHAT WAY WERE YOU INVOLVED IN THE ACCIDENT?** (Check the right answer)
   1. Driver..... 2. Passenger..... 3. Pedestrian.....
3. **IF POSSIBLE, INDICATE WHO WAS AT FAULT.** Check one: 1. The other driver.....
   2. The pedestrian..... 3. You, the driver..... 4. Other (Specify).....
4. **IF YOU CARRY INSURANCE,** check the kind.
   1. Collision..... Amount deductible $..... 2. Public Liability and Property Damage.....
   3. Medical Payments..... 4. Comprehensive (Fire and Theft).....
5. **HOW MANY WERE INJURED OR HOSPITALIZED AS A RESULT OF THE ACCIDENT?**.....
6. **WHAT FINANCIAL LOSS DID YOU SUFFER BECAUSE OF YOUR OWN INJURIES?**
   1. Personal injury $..... 2. Property loss $.....
7. **WHAT FINANCIAL LOSSES DID YOU SUFFER BECAUSE OF YOUR DEPENDENTS' INJURIES?** $.....
8. **FROM WHAT SOURCES DID YOU OBTAIN FUNDS TO PAY THESE LOSSES?**
   (Own collision insurance or other driver's insurance, for example).....
9. **CONCERNING YOUR CLAIM AGAINST THE OTHER PARTY OR HIS INSURER:** (Check the right answer)
   1. Did you hire a lawyer? Yes..... No..... 3. If you sued, was judgment in your favor? Yes..... No.....
   2. Was it settled without suit? Yes..... No..... 4. Have you collected it? Yes..... No.....
10. **IF YOU WERE A DRIVER OR OWNER,** check one:
    1. Did you use your own collision insurance? Yes..... No.....
    2. Did you collect from the other party's insurer? Yes..... No.....
    3. Did you collect from the other party personally? Yes..... No.....

Philadelphia Business Index

The September 1950 issue of the Bulletin presented a new index of general business conditions in the City of Philadelphia. This series, prepared and since maintained by Robert T. Kline, was designed to reflect economic activity exclusively within the boundaries of the City of Philadelphia. It was originally based upon a combination of statistical data representing (1) industrial electric power sales; (2) indexes of employment and employee-hours; (3) department store sales[1]; (4) bank debits[2]; and (5) total construction. Because the method of reporting certain data is under revision by the originating agencies, the change in average weekly hours worked and the monthly change in total employment in the Philadelphia metropolitan area, both prepared by the Department of Research of the Federal Reserve Bank of Philadelphia, have been substituted for (2) above. This is a temporary expedient to maintain continuity of the index. The original data series will be restored after revision.

The following table presents the index for the years 1939 through 1959, and by month from March, 1959.[3]

Index of General Business Conditions, City of Philadelphia, 1947 = 100

Year	Index	Month	Index
1939	73	1959	
1940	77	Mar.	132.2
1941	96	Apr.	136.5
1942	99	May	142.3[1]
1943	106	June	142.0
1944	106	July	140.4[2]
1945	98	Aug.	142.4
1946	100	Sept.	142.6
1947	100	Oct.	142.0
1948	103	Nov.	138.6[3]
1949	97	Dec.	136.8
1950	108		
1951	111	1960	
1952	111	Jan.	138.6[4]
1953	119	Feb.	136.2p
1954	119	Mar.	138.5e
1955	124		
1956	128		
1957	130		
1958	128		
1959	138		

p = preliminary

e = estimated. Based on currently published weekly indicators.

[1]The revised index of Department Store Sales, published by the Federal Reserve Bank of Philadelphia, has been used in the composite index since October, 1951. Beginning September, 1957, the new seasonally adjusted Department Store Sales series (1947 = 100), published by the Philadelphia Federal Reserve Bank, has been used. See also footnote 4 to the Table following.

[2]The revised Wholesale Price Index, all commodities, published by the BLS, is used beginning January, 1952 as a deflationary index for the Bank Debit Series.

[3]Kline, Robert T., "A Measurement of General Business Conditions in the City of Philadelphia." **Economics and Business Bulletin,** Temple University School of Business and Public Administration, Philadelphia, Pa., September, 1950, pp. 33-40.

[1]The large increase for May over April is primarily due to an increase in Commercial Power and Light Sales. In fact, this increase is further felt from June through September, in which latter month raw commercial power and light saels reached an all-time high. The Edison Electric Institute attributes these new highs to increased use of air conditioning equipment because of unusually hot weather along with growth in demand.

[2]The drop off in July is due to a severe decline in freight car loadings and construction, apparently caused by the steel strike, which is also reflected in the data for the months from August to November.

[3]The drop in November and December 1959 is due primarily to the decline of two components in the series, Commercial Power Sales and Debits to Individual Accounts, after seasonal adjustment. Although textile production for the City is not a component part of the index, it may be noted that textile producion declined greatly after seasonal adjustment, in November and December 1960. Freight car loadings increased to near highs for the year in these same months.

[4]New indexes of seasonal variation have been computed and are being used (effective Jan., 1960) for Department Store Sales.